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MANUFACTURERS' RECORD.

A WEEKLY SOUTHERN INDUSTRIAL, RAILROAD AND FINANCIAL NEWSPAPER.

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Manufacturers' Record.

RICHARD H. EDMONDS, President.
THOMAS P. GRASTY, Vice-President.
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COPY FOR ADVERTISEMENTS.

Advertising copy (changes or new advertisements) should reach us Saturday Morning to insure insertion in the issue of the following week. For the first issue in the month we should receive copy by Friday Morning of the week preceding.

This issue of the Manufacturers' Record consists of two parts. Part I is the regular weekly issue, and Part II is the "Twentieth Anniversary" feature, it having been deemed best to publish the latter in separate cover from the regular paper.

BUNCOMBE.

All doubt about the buncombe in a proposed anti-trust measure in the legislature of Maryland was removed by the adoption by the lower house of an amendment, drafted by President Gompers of the American Federation of Labor, which provided that nothing in the act should be construed as applying to trade unions or other labor organizations. What Mr. Gompers has to do with framing laws for the people of Maryland does not clearly appear. But his expressed hope that the bill might be defeated in case the amendment should not be adopted indicates a recognition on his part that an anti-trust measure would naturally apply to some of the labor organizations of the country, and if enforced, would remove all reason for the existence of labor leaders. The adoption of the amendment was an indication that the passage of the bill would be without any effect except upon the dupes of agitators. Such an exception as that proposed by Mr. Gompers would undoubtedly work toward a judicial declaration of the unconstitutionality of the measure. The bill failed, but not before Mr. Wells was heard upon it. Its introduction was, therefore, not in vain.

Regarding plans for the establishment of a $150,000 cotton mill at Brenham, Texas, Mr. D. C. Giddings, Jr., writes to the Manufacturers' Record:

From the number of letters I have received in regard to this proposed building, I am pleased to believe that the Manufacturers' Record is a splendid advertising medium.

THE SOUTH TO ENJOY CONQUESTS OF NEW MARKETS.

It must be with peculiar satisfaction that you look back from the twentieth milestone in the history of the Manufacturers' Record upon the progress which has been made by your journal (which so ably serves the industrial interests of the South), and by yourself and the others who were present at the birth of that enterprise, and who are now enjoying the fruits of industry and perseverance. So closely identified has your journal been with all that has gone forward in the South of late years, "part of which you were and all of which you saw," that it seems something in the nature of gratuitous advice to offer any suggestions touching what has been done and what as yet remains to be accomplished in the line of Southern development.

Bradstreet's is, of course, interested in the success alike of all sections of the country, but it is with special gratification that we view the progress made in the last twenty years at the South, and the ample promise held out of good work yet to be done, because, as you yourself know, Bradstreet's has always been prompt to record new developments in Southern trade, which its close connection commercially, particularly in credit reporting and in the recording of cotton-crop and other conditions, enable it to make. It would be only traversing already familiar paths to write of the marvelous developments in agriculture, in industry and commerce which the South has made in the lifetime of the Manufacturers' Record. On the other hand, viewing results already achieved and the obstacles already surmounted, it needs no sanguine eye to see that the progress already made is but a tithe of that which promises during the same period of time in the future. The future of the South, particularly in the line of manufacturing, is indeed a flattering one. Nowhere else in the world can there be found such a close grouping of all the raw materials, such as cotton, coal, iron, lumber and oil, which go to form a basis of industrial activity. Soil and climate alike appear to lend themselves to furthering this activity, and recent census returns point to the varied attractions of that part of the country, attracting the industrious and capable of other States and countries to the South. To a greater extent probably than any other section of the country will the South share in the fruits of conquests of new lands and markets which are embraced in the present movement of commercial expansion, and rich, indeed, promises to be the heritage which the South of today will leave to its children and its children's children.

BRADSTREET'S.

BRITAIN NOT DESPAIRING.

The Iron and Coal Trades Review of London recognizes that the supremacy that once belonged to Great Britain in practically everything that pertains to the domain of manufacturing industry has now largely been wrested from it by rival nations possessed of greater resources, greater enterprise, larger capital or other advantages. It says:

Not more than twenty years ago Great Britain was the greatest producer of coal, iron ore, pig-iron, steel of all kinds, tinplates and other important manufactured commodities among the nations of the earth. This is now a thing of the past. Last year the United States established another "record" in making more open-hearth steel than our own country, and it is regarded as probable that this year the United States will complete their series of records by manufacturing a larger tonnage of tinplates than ourselves. The fact is there are very few fields left unconquered by our wonderfully energetic kin across sea. Shipbuilding is almost the only great industry in which our paramountcy is still unquestioned, but we do not know how long this may continue to be so. Shipbuilding, of course, carries with it supremacy in naval engineering, and practically in all that belongs to the shipbuilders' art. It also, in this case at least—and it may in any analogous cases in the future—carries with it supremacy upon the ocean. But what of the outlook? The United States but a few years ago were producing less than 50,000 tons a year of iron and steel shipbuilding, whereas this year is likely to give them from 350,000 to 400,000 tons. During the last few years many new shipbuilding yards have been built in the United States, some of them equal in extent and in the variety and perfection of their equipment to anything that is to be found on the Clyde, the Tyne or the Wear. The Americans evidently mean to be well to the front in both shipping and shipbuilding. They have cheaper materials, speaking generally, than any other nation. They lack experience on a large scale, however, and they have to pay higher wages to the men employed both in building and in manning ships.

In spite of its admission that there is a danger that American shipbuilders may ultimately take from Great Britain part of its shipbuilding trade, the Iron and Coal Trades Review has not lost heart about the general prospects, but contends that in coal, iron and steel, machinery and hardware British firms still have by far the largest foreign business of any in the world. It protests, therefore, vigorously against the pessimistic tone of the English press about American competition, pays high tribute to British capacity and enterprise, and says:

We should not probably have said so much that is calculated to stimulate self-complacency in our fellow-countrymen had we not felt that the exhortations given in this journal on previous occasions have been laid to heart, and that we are at last really "clothed and in our right mind" as to our work in the future. Had the diatribes of the daily press been justified, the only possible attitude left to the British manufacturer would have been one of despair. Is there any evidence that this has become the settled complexion of his business? On the contrary, we have not the least hesitation in declaring that from one end of the kingdom to the other the British manufacturer has not only made up his mind to set his house in order, but is actually and persistently and zealously doing it. We know of very few establishments of any importance throughout the length and breadth of the land that either have not already been remodeled and improved, or are now being so, and we are confident that there never was a time when so much was being done in building auxiliary works and plants of every kind. In nearly every case of the kind with which we are acquainted the design, machinery and equipment generally are thoroughly up to date. Let our labor and transportation conditions be modified, and we shall have but little cause to fear for the future.

All of this is very patriotic and very commendable, and is calculated to check extravagant notions about American competition with Great Britain held both in England and in America. There is no doubt that the rapid strides made by the United States as an exporter of manufactured goods have wrought a change for the better in methods in Great Britain, and it may be reasonably expected that the continued interaction of influences in the two nations will bring about a wonderful industrial development for the whole world.

ADVERTISING TEXAS.

It is pretty certain that Texas will be well represented at the Louisiana Purchase Exposition next year. The newspapers of the State are making a persistent and vigorous campaign in that direction, which will not be without excellent effect. The Jimplicute of Jefferson in a recent issue made a strong plea that Texas show at St. Louis what fields it presents for investments, and said:

Her 3,000,000 bales of cotton can and should be made ready for the markets of the world within her own limits; every hide should be made into leather, and the leather made to supply all the wants of man; her timber should be made into furniture, wagons and every class of vehicles; her iron ores should be made into everything made of iron, and the markets supplied with the manufactured article; her wheat and corn, rice and other cereals should leave the State ready for use—in fact, nothing should leave the State in the raw or unmanufactured state. This all can be done within her borders, because Texas has the cheapest fuel today of any State or country on earth. Is it not therefore a very proper and important question, what will Texas do? Will her exhibit at St. Louis be a fit representation of her grandness?

The Jimplicute suggests that if fifty cents per capita of population in the State be raised it would be possible to make a magnificent display, and that the commisisoners' court of each county contribute ten or fifteen cents per capita, in consideration of which each county should be permitted to have for circulation at the exposition printed pamphlets giving practical facts about the resources of the respective counties. This is a decidedly practical suggestion, and in line with the enterprising spirit which the press of the whole State is displaying. It is an advertisement in itself of Texas.

The Nashville American has urged the abolition of two or three State officers, including the labor bureau, which it regards as practically valueless to the working people, and the State factory inspectorship, which is characterizes as a sinecure, from which neither employers nor employed get adequate returns. Other States have similarly useless offices created as sops to special interests. In two or three instances in the South the labor bureaus are performing valuable service, but in the

main they are not only useless expense, but really a menace to the peace and prosperity of the State.

THAT PUBLISHING SCHEME.

Two weeks ago the Manufacturers' Record advised the South to disregard a visionary scheme connected with the book-publishing business. We viewed the project solely from a business standpoint as affecting Southern educational interests. The promoter of the scheme took occasion, in commenting upon our editorial, to write:

The Manufacturers' Record misled you, as it may do others.

Now, the Manufacturers' Record is not accustomed to mislead people. It carefully avoids the flamboyancy which characterized the preliminary literature of the promoter of this scheme, and it took special means to demonstrate that the letter which he had persuaded a Southern governor to circulate as a part of the promotion was in itself misleading. Of course, the Governor can hardly be held responsible for misconceptions due to his letter, and he showed his faith in the proposed undertaking by attending the meeting at Charleston called by the promoter. On the morning of that meeting local announcement was made that "all, or nearly all, the Southern States will be represented in the meeting by capable and earnest delegates, who have come to Charleston to attend it." The Manufacturers' Record has carefully scanned the reports of the meeting, but has failed to discover that it approached at all the expectations about it. Where were the delegates from "nearly all the Southern States?"

This demonstration was exactly of the kind to be expected, and it is gratifying to note that the position taken by the Manufacturers' Record toward the project has been backed up by leading Southern newspapers which have given any thought to it.

THE APPALACHIAN PARK.

A measure which the present Congress should pass is that providing for the establishment of a great forest reserve in the Southern Appalachians. This has the earnest endorsement of Secretary Wilson of the Department of Agriculture, who has made a special study of the subject, and is favored by men of many parts of the country, who realize the importance of protecting the headwaters of a system of rivers draining in one direction toward the Atlantic ocean and in another toward the Ohio and Mississippi rivers. The increasing value of the streams of that section is shown in recent publications of the United States Geological Survey dealing with the measurements conducted by the hydrogaphers of the Survey. These show that most of the rivers of Georgia, Alabama, Eastern Mississippi, Tennessee, and some of Florida, to say nothing of those of the Carolinas, have their origin in the Appalachian region at elevations between 2000 and 3000 feet above sea-level. The constant flow of these streams, with their rapid fall, are sources of a large amount of power, which may readily be developed for industrial purposes. Some of this power has already been utilized, but much of it is still running to waste. Upon the preservation of the forests protecting and regulating the head springs of these rivers depends the constancy of the power.

Again, it is shown that the greatest masses and the highest peaks of the Appalachian mountain system, forming the backbone and watershed of the eastern part of the United States, are in Western North Carolina and Eastern Tennessee, and that seven Southern States are watered by rivers rising in this great divide, while one of the principal tributaries of the Ohio and one of the largest feeders of the Mississippi head in the same region. Great inroads have already been made upon this great forest reserve, yet there is no other place in the United States of an equal area covered with so great a variety of valuable timber.

That timber should be handled upon a most approved plan for its preservation, not only that it may be maintained indefinitely as a source of immediate wealth, but also that the important streams nourished in those forest-clad elevations shall lose none of their valuable properties. The passage of the act creating the Appalachian Park will insure both results.

A bill has been favorably reported in the senate of Mississippi appropriating $25,000 for the creation and conduct of a State geological survey. It is believed that Mississippi could make no better investment at this time. Other Southern States, notably Georgia, Maryland, North Carolina and Texas, are reaping the benefits of such a medium for discovering and making known to the world the natural resources of their respective States for industry.

Special Days at Charleston.

Among the days which have been selected for special purposes at the Charleston Exposition are the following:

Illinois Day, March 11, 1902.

Louisiana Day, March 27, 1902.

Concatenation of Hoo-Hoos, March 29, 1902.

Virginia Polytechnic Institute, April 1, 1902.

Shriners' Midway Night, April 2, 1902.

Limestone College Day, April 3, 1902.

Shriners' Day, April 3, 1902.

North Carolina Week, April 7 to 14, 1902.

I. O. of R. M. of North Carolina, April 9, 1902.

Charlotte Day, April 9, 1902.

North Carolina Editors' Day, April 10, 1902.

Virginia Military Institute, April 20, 1902.

Grand Lodge of Junior Order of United Mechanics, April 24, 1902.

Louisiana Purchase Exposition Day, April 30, 1902.

State Bankers' Association, May 7, 1902.

Southern Cotton Spinners' Association, May 8, 1902.

Independent Order Odd Fellows, May 13, 1902.

In addition to the dates stated, there will be a Maryland Day, a Baltimore Day and a New York State Day. The governors of most of the other States have under consideration the appointment of days for their respective States.

A Big Pickling Plant.

It is announced at Portsmouth, Va., that the H. J. Heinz Company of Pittsburg, Pa., has definitely decided to locate a branch pickling plant there. A site has been secured at Port Norfolk, where an extensive pickling plant will be equipped, designed mainly to supply the Southern trade, but some exporting will also be transacted from this branch. Contracts will be made with farmers for supplies of vegetables and other products of the soil. Plans will be prepared at once for the buildings necessary, so that an early commencement of work can be arranged.

SOUTHERN COAL IN AMERICAN TRADE.

By F. E. SAWARD, Editor of the Coal Trade Journal.

[Written for the Manufacturers' Record.]

Twenty years have elapsed since the Manufacturers' Record, under its able management, took up the cause of industrial expansion in the South, and right well has it continued to fight for the cause. There have been ups and downs, but the "ups" now are ahead, and it surely appears that the seat of greatest prosperity at any point of the country is to be that to which the Manufacturers' Record is devoted. It is pleasing to know that its originator has continued in health and vigor, and today conducts it as ably as at the outset.

There will be many records of growth dealt with in this special anniversary number, for twenty years in the Southern industrial field means very much indeed—more than in many other sections of the country. The railways, then the mines and furnaces, then the growth of population, then wealth—so it goes. The basis of the wealth of any country is coal and iron and the markets therefor.

There is to be a trade expansion in the next twenty years beyond the borders of this country that is almost beyond the dreams of the most optimistic. One who is alive then will cause benisons to rest on the head of the brainy man of this age who saw the possibilities and labored to the development thereof. The Southern States are to supply much of the future growth of our commercial interests. There will be a vast increase in the coal tonnage. My latest report from the other side as to the condition which confronts England is that it is not a question as to whether Americans can compete with her coal, but as to whether they will. "In the event of any wane of the present activity in the United States, we have no doubt that large supplies of Pocahontas and Fairmont coal would be shipped to Europe with little regard to profit or loss. This is the American alternative to restriction of output in the maintenance of prices." And it is also remarked that in view of the growing expansion of the American coal trade and the serious inroads which are likely to be made on the British position in the principal European markets as a result of this unexpected competition, economies must ensue at British mines. "There is no question that by employing larger cargo vessels than are now in use the American competition will increase and become more aggressive. Moreover, the continued depression in the freight market will tend to equalize the conditions under which we have to meet this new and formidable competitor."

Prices abroad cannot be reduced. It is the unsettled condition of labor that makes for higher cost, and this offers an object-lesson to our own people. Fortunately, West Virginia and other Southern coal miners know a good thing when they have it, and are not inclined to go idle under trivial pretexts. In Great Britain last year there were 624 wage disputes, and 3,930,000 workdays were lost by reason thereof. Fully two-thirds were in mining. Only 27 per cent. of the work-people gained their points, and nearly 33 per cent. of them were entirely defeated, while in the case of 36 per cent. the disputes ended in a compromise. The question of an eight-hour day is up again in the British legislature, and may be a severe drawback to the coal trade. Any restriction of output on the extensive and systematic scale that would undoubtedly be implicated in an eight-hour day would permanently and very appreciably raise the price of coal to every consumer on the Continent, in South America or elsewhere.

Many excellent deductions may be made from what has been here outlined, but the very strongest of all is the paramount position of the Southern mineral resources; the next is the place they will play in our trade expansion, and then the part of labor. On this latter point our people may well take a lesson from the evils that have befallen Great Britain from labor disputes, and avoid them.

FURNACES OF THE SOUTH.

Changes and Improvements Now Being Made.

Mr. James M. Swank, general manager of the American Iron and Steel Association, in gathering information from all the iron-producing companies in the United States on December 31 for his annual report, secured the following information relating to furnaces now out of blast and to be blown in shortly, furnaces to be built, and some prospective changes in the South:

The Buena Vista furnace of the Virginia Iron, Coal & Coke Co. at Buena Vista, Va., ran for twenty-three weeks during 1901. It was idle on December 31, but the company expected to again have it in blast on January 15. It also expected to blow in Dora furnace at Pulaski City, Va., on the same date.

The Gem furnace of the Empire Steel & Iron Co. at Shenandoah, Va., did not make any pig-iron in 1901. The company advises us, however, that it may blow in the furnace during March or April.

The Low Moor Iron Co. of Virginia has not as yet broken ground for its projected furnace at Low Moor. The size of the new stack will be 90x19 feet.

The Graham Iron Co. of Graham, Va., has leased from the Virginia Iron, Coal & Coke Co. its blast furnace at that place. The stack has been repaired, and will probably be blown in some time in February. Foundry and basic open-hearth pig-iron will be made. The officers of the company are Frank P. Howe, president; Frank Samuel, secretary and treasurer, and Walter Graham, vice-president and general manager. The company has an office in the Harrison Building, Philadelphia.

The Reed Island furnace of the Virginia Iron, Coal & Coke Co. in Pulaski county, Virginia, ran for twenty-six weeks during 1901. Cold-blast charcoal iron was made. There were only two charcoal furnaces in operation in Virginia in 1901.

The new furnace which the Tube Steel Co. is erecting at Benwood, W. Va., will not be completed until some time next summer. Its size will be 100x21 feet.

The Hillman Land & Iron Co. expects to have its two furnaces at Grand Rivers, Ky., in operation in February or March. Coke will be used for fuel instead of charcoal. Both furnaces have been idle since 1892.

The Virginia Iron, Coal & Coke Co. had one of its two furnaces at Middlesborough, Ky., in operation last year. Its idle stack may be blown in in March or April.

The Cranberry Furnace Co. has leased from the Virginia Iron, Coal & Coke Co. its blast furnace at Johnson City, Tenn., and expects to have the furnace in blast toward the end of February. Special Bessemer iron, not exceeding .025 in phosphorus, will be made. Ore from the Cranberry mines will be used. The name

of the furnace has been changed from Carnegie to Johnson City. William Wilkins is manager.

Helen furnace at Clarksburg, Tenn., is now operated by the Red River Furnace Co. It was blowing on December 31.

The furnace of the Napier Iron Works at Napier, Tenn., ran for fifty weeks during 1901. It was blowing at the close of the year. Foundry pig-iron was chiefly produced.

The Tennessee Coal, Iron & Railroad Co. had only one of its three furnaces at South Pittsburg, Tenn., in operation at the close of 1901. The date when its two idle furnaces will be blown in is uncertain.

The La Follette Coal, Iron & Railway Co. of La Follette, Tenn., had not blown in its new furnace on December 31. The stack is 95x20, and has an annual capacity of 125,000 tons.

Bear Spring furnace at Bear Spring, Tenn., is now operated by the Dover Iron Co. Charcoal pig-iron is produced.

The Buffalo Iron Co. of Nashville, Tenn., has discontinued the use of mixed charcoal and coke for fuel. Hereafter coke will be used in all its furnaces. On December 31 it had one furnace in blast at Mannie, Tenn. It expected to blow in its idle stack at that place in February.

The Georgia Iron & Coal Co. of Atlanta, Ga., did not operate its Rising Fawn furnace last year. The company may erect a new furnace in 1902.

Tallapoosa furnace of the Georgia Vineyard Co. of Tallapoosa, Ga., was idle during 1901. The furnace may be sold in the near future.

The Alabama Consolidated Coal & Iron Co. is now enlarging one of its Clifton furnaces at Ironaton, Ala. It expects to have the furnace ready for blast in February.

The new furnace which the Central Iron & Coal Co. is erecting at Tuscaloosa, Ala., will be 85x18 feet, and will have an annual capacity of about 60,000 tons of foundry iron. Coke will be used and red ore from Red mountain and brown ore from the Woodstock district in Alabama.

The Pioneer Mining & Manufacturing Co. of Thomas, Ala., which is controlled by the Republic Iron & Steel Co., expects to have its new furnace completed in March.

Only one of the three Sheffield furnaces of the Tennessee Coal, Iron & Railroad Co. at Sheffield, Ala., was in operation on December 31. The date when the two idle furnaces will resume has not been settled.

The Sloss-Sheffield Steel & Iron Co. had three of its four furnaces at Birmingham, Ala., in blast on December 31. The idle furnace is being rebuilt, and is expected to be ready for blast on April 1. Its three active furnaces were practically rebuilt last year.

The United States Cast-Iron Pipe & Foundry Co. advises us that the report that it contemplated erecting two new blast furnaces at Sheffield, Ala., is premature.

The Northern Alabama Coal, Iron & Railway Co. expects to blow in its furnace at Talladega, Ala., in February. It was idle during the whole of 1901.

The two Oxmoor furnaces of the Tennessee Coal, Iron & Railroad Co. at Oxmoor, Ala., were idle on December 31. The date when they will resume is unsettled.

C. E. Buck & Co. are now operating the blast furnace at Trussville, Ala. The name of the furnace has been changed from Trussville to Ella. It was in operation for about nine weeks in 1901.

The Williamson furnace at Birmingham, Ala., is no longer leased by the Jones Valley Iron Co. Communications concerning the furnace should be sent to the Williamson Iron Co. at Birmingham.

The Woodword Iron Co. of Woodward, Ala., expects to blow in one of its two furnaces in February. Both furnaces were running last year, No. 1 being in blast fifty-two weeks and No. 2 for forty-two weeks. One was idle on December 31.

The Shelby Iron Co. of Shelby, Ala., had one of its two charcoal stacks out of blast on December 31 for repairs. The idle furnace is expected to resume in February.

The Jefferson Iron Co. of Jefferson, Texas, expects to blow in its charcoal furnace early in 1902. It was idle during the whole of 1901.

The Pig-Iron Market.

Matthew Addy & Co. of Cincinnati in their weekly report say:

"While the pig-iron market is buoyant, and sellers have so much to do that they wish the days were forty-eight hours long instead of twenty-four, yet there are more troubles and annoying features in current trade than ever before. This does not apply, of course, to new orders, for they are being booked for delivery over the last half of the year, and no one is finding fault with prices or terms. It applies to the difficulty in supplying iron now due on old orders. In the first place, there is not enough spot iron to go around. Consumers are being compelled to shut down for days at a time because of the non-delivery of raw materials. There has never in previous years been such an absolute shortage of coke and iron as at present. But the worst of the situation is that the railroad companies are utterly inadequate to properly and promptly handle the traffic that is offered them. They are short of cars primarily, and then they are short of locomotives. It has been reported that the car situation is gradually improving; on the contrary, it is worse today than it has been. In the South there has been a betterment, but the Northern roads are far behind. The Southern roads are not allowing their cars to go north of the Ohio river except in a few isolated cases, and at every one of the Northern gateways there is a congestion and accumulation of pig-iron that is hopeless. Our mails are burdened with the requests of customers to hurry forward iron that has been shipped them, but which is in the blockades at various Ohio river points. Furnaces have been banked for lack of coke, and foundrymen who in some cases have iron have not been able to secure the coke with which to melt it. A few months ago such a situation would have seemed impossible, but today it is plainly apparent. With all our boasted facilities we are not in any proper shape to handle the business of the country when it is at flood-tide.

"As for the new business of the week, it is a repetition of the same old story. An immense quantity of all kinds of iron has been sold. Orders have ranged from 5000 tons down to 100 tons, deliveries for the main part being from July through December. There is no diminution in inquiry, and there is every reason to expect that trade will continue for some time to come as at present. It might also be said that trade promises to continue indefinitely, except that the day must inevitably come when the iron available for sale will have been sold. That, apparently, will be the only limit to the present prolonged buying movement."

A company recently organized at Petersburg, Va., will not only manufacture peanut oil, but will grind the hulls.

THE METROPOLIS OF FLORIDA.

Wonderful Recuperative Ability of Jacksonville.

[Special Cor. Manufacturers' Record.]

Jacksonville, Fla., February 6.

How strikingly true it is that "the world will little heed or long remember" even the great calamities which come to us may be demonstrated by asking any man living a thousand miles from here when it was the Jacksonville fire occurred, and how much of a conflagration it was, anyhow; and even one who today drives over the busy, bustling city, with only here and there an undisturbed mass of debris, all else being order, with finished dwellings and business houses appearing on every hand, will find it hard to realize that no longer ago than May 3 of 1901 140 of the best business and residence blocks of Jacksonville were licked up in a roaring conflagration that raged unimpeded for eight hours, leaving 455 acres of embers and ashes, making 10,000 people homeless, and entailing a net loss of something like $15,000,000. The horrors of an eight-hour battle with death and destruction, the misery and want and desolation of the hours and days and weeks that followed—for it was utter darkness that night; the water service was also destroyed; people, almost naked, and consumed with thirst, wandered aimlessly about the whole night through, and then for long after had to be fed by the utside world—these are features which no one not there can know, and a faint conception of which can only be had through hearing the story from the lips of one who endured it all.

But the rapid recovery from the disaster is a fact so big that all may see, and seeing, cannot withhold applause. Beautiful stone structures are nearing completion in the business portion, handsome homes have already taken the place of those burned down, the new Windsor Hotel would do credit to most any city, and the destruction of many of the piers has furnished the opportunity to widen and extend River street, and build new and more adequate piers, adapted to the growing river commerce of the place.

There has not yet been entire recovery from the fire, of course, for among the 2368 buildings destroyed were the county courthouse, with the records; the City Hall and market, the Board of Trade and City Library, the fire department and three engine-houses, police headquarters and jail, the armory, seventeen churches, The High School and the Seminole and Elks' Club buildings. But that so much has been done in so short a time is truly marvelous to one who visits the burned district and hears the story of the fire, and it gives one a thrill of pride to recognize in the clear grit of these Jacksonville people the kind of stuff out of which are made communities worth talking about. The vigor with which they have addressed themselves to repairing their fortunes and to going their destined way as the pre-eminent commercial center of the section inspires an admiration and a confidence for and in them which may, after all, give to the fire some of the elements of a blessing in disguise.

It is all the more notable, this vigorous recovery from an appalling disaster, when one remembers the other calamities from which Jacksonville has suffered—yellow fever in 1888, and the freeze of 1894-95, which destroyed millions of dollars' worth of Florida fruit and paralyzed the commerce of the State. And Jacksonville never was a wealthy community, either. In looks, spirit and lack of inherited wealth it impresses one very much as do thriving, growing, ambitious cities of its class in the West. The city and the people in it have a future; they know it, and they propose to carve it out in the face of any and every obstacle.

There was distributed in relief to the victims of the fire $230,000 in money, and as much more in food, clothing, furniture and tools. How carefully the local committee distributed this relief and how needy must have been those who received aid is illustrated by an incident related. A man who had lost his home and his business, but who was not destitute, asked to be helped to make another start. When the chairman of the committee described to him the misery and want of many of the other 10,000, the applicant drew a check and handed it over for the relief fund.

The work of relief began early on the morning after the fire. Shelter, clothing, food, everything, was needed for the thousands of homeless, hungry and naked men, women and children. A meeting of the Council and Board of Trade was called to create a permanent relief committee. In that meeting a dispatch was read announcing that the New York Chamber of Commerce and Merchants' Association had met together, organized a relief committee, with Abram S. Hewitt as chairman, and almost before the fire had been extinguished had started a train of twelve cars, loaded with provisions, for the Jacksonville sufferers. The train had been given right of way, and the $20,000 worth of supplies it contained would soon come thundering into town. No cry for aid had gone up as yet; the people were almost too dazed to realize what was their condition or what steps for relief would be required, and this spontaneous haste to thus generously come to their aid so touched and overwhelmed the meeting that men broke down and cried.

The work of systematic assistance proceeded as rapidly as could be. It was found that thousands of people would have to be sheltered in tents for months to come, and on May 13 an appeal for help was sent out to the world. The response was generous, though the needs of the sufferers were great, many of them having lost everything in the world they owned. There was much sickness in the camps also, and in addition to the six who perished in the fire, a number of others, mostly women, subsequently died from the effects of the shock and exposure.

The amount of insurance involved was not large—only some $5,000,000 or $6,000,000 in all—but the companies required time to make payments, and as much delay as technicalities would give they took advantage of. It was thus some three months before those who carried insurance were able to collect on their policies, and building operations were delayed that long. It is therefore proper to say that the great recovery of Jacksonville has practically come about in a little more than six months' time. The relief committee finished up its work, made final reports and adjourned sine die on the last day of the year.

That the Jacksonville of the future will be a much better-built city than the Jacksonville of the past is evidenced by the buildings already completed and under way, and the presence here of excellent architects from all parts of the country gives assurances of a diversity in architecture which will relieve the city of any aspect of monotony in the style of its buildings.

And so the metropolis of Florida turns a bright and confident face to the future. Such wounds as have been hers do not entirely heal in a day or a year, but with her indomitable pluck, she will not only fully recover, but will reach heights of greater importance, power and glory as the years go by. ALBERT PHENIS.

FLORIDA'S EAST COAST.

Wonderful Changes Wrought for Pleasure and Profit.

[Special Cor. Manufacturers' Record.]

Palm Beach, Fla., February 17.

Hardly in the world, to say nothing of the South, has there been such a wonderful development, such a transformation from inhospitable conditions to most luxurious comfort, as has been wrought all down the east coast of Florida, in much less than twenty years, by Henry M. Flagler, many times millionaire, and, next to the Rockefellers, the largest owner of Standard Oil stock. From old St. Augustine to new Miami there is a succession of palatial hotels, which rival the best of the world's caravansaries, and around them all is such a paradise of palm and flower and shaded walk, such a flood of golden sunshine, blue sky, limpid water and balmy air, that all else seems crude and harsh by comparison, and knowing them once, you dream of them forever. It is at Palm Beach that all the elements seem to conspire to give perfection, and this American Riviera, as it has come to be known, is so great a rival now of the old Reviera that travelers say the praises of Palm Beach are heard in every resort along the Mediterranean coast.

It took $18,000,000 of Mr. Flagler's money to bring about this wonderful change, this transformation of a wilderness to a paradise, and it is of importance to the South that the undertaking is a commercial proposition, that "it pays," and that providing a playground and entertainment for men of leisure is merely an incident in the development of the millions of acres of jungle in which Mr. Flagler invested in the early eighties. With the genius of a true land boomer of the leading class, he planned good hotels to begin with, and he built a railroad that he might be sure people could get in and out and could get to market the produce which he proposed that settlers should raise on the lands he would sell them. Flagler's hotels soon became famous everywhere, and instead of the few hundred thousands he had planned to put in them, he invested millions, and the other day he declared it was taking all his income to increase his hotel accommodations and transportation facilities so as to take care of the people who are coming in in increasing numbers year by year.

The people who, under a mistaken notion, are sometimes given to criticising corporations and great aggregations of capital, ought to be able to see what has been accomplished on this east coast of Florida by the creative power of the vast wealth which has come to Mr. Flagler through his interest in the Standard Oil Co. But for the $18,000,000 or $20,000,000 which he has invested in this section this portion of Florida would probably be not much less backward and dreary than it was fifteen or twenty years ago, before he touched it with the magic wand of accumulated money.

The Florida East Coast Railway runs from Jacksonville to Miami, and much of the land along the line is devoted to orange-growing, pineapple-raising and truck-farming. While these industries have grown in this section from a small beginning to such proportions that a fast fruit express with a 40-mile schedule is now run to rush the produce to Northern markets, it is yet true that in comparison with the unoccupied lands merely a beginning has been made, and there has been no relaxing of effort on the part of Flagler's land and industrial commissioner to induce settlers to locate. That the development is only in its infancy Mr. Flagler himself believes, for with every requisite in the way of soil and climate, the great fact of close proximity to the markets of the North is believed by him to foreshadow a development of the section beside which present operations are mere experiments. There may not always be such profits as at present in truck and fruits, although the first in the market has always and probably always will command a gilt-edged price, but in any event the returns at present are so alluring that rapid development must follow for years to come. When one hears of a tomato crop yielding $30,000 profit in one year, of fruit-raisers and truck-farmers who have a succession of crops the whole year through, and who, besides enjoying a climate which is like springtime most of the months in the year, are getting rich in their pleasing vocation, the temptation to try a Florida fruit farm is hard to put by, especially if it come to a man when snowbound and shivering beneath the icy blasts of the North. The New York Herald publishes the noon temperature at the various resorts, and no doubt this eloquent table is responsible for many a tourist and homeseeker turning his face toward Florida, especially when, as during the recent blizzard, he finds the Palm Beach thermometer showing 75, while his blood is congealing over a temperature of 4 below. And there is testimony to show that Florida summer heat is by no means the bugaboo the dweller of the far North would regard it. Last summer might be considered a fair season for testing the difference, when for weeks in July the whole North seemed a very furnace. Mr. Flagler told me he had remained at his cottage at Palm Beach till August, and had found it as pleasant as he could ask. However, if one could make a few thousands on a crop each year he would probably not begrudge the time and money a trip to Bar Harbor would require.

Judging by the standard of values established at the hotels, they are not devoid of usefulness in the line of circulating currency in their communities, although it is doubtless true that Mr. Flagler does regard them as mere incidents to the development of the country. Dewey and Joe Jefferson were at the Breakers at Palm Beach this winter. "We are glad to have such distinguished visitors," said Mr. Flagler to me, "but one excursionist looking for a home, to whom a trip to Florida is an event, is worth more to the country than several such. He will go home and tell all his neighbors of the wonders he has seen, and it will be neighborhood gossip for all time to come. The consequence is that some of those people will come down here and buy a farm."

Mr. Flagler does not pose as a philanthropist; in fact, if he poses at all, it is as one who does not pose. "I long ago made up my mind that I didn't want to wear any red feathers," said he. "I don't want any front seat, and I am just going along and letting what is being done here speak for itself."

It is nevertheless true that he takes the most active interest in the settlement of the country and in the welfare and prosperity of the fruit and vegetable growers who locate along his line. When the big freeze occurred in 1894-95 he loaned money to the victims, and it was he who started the movement further south, noticing, as he had, that in Dade county, around Miami, no frost had come, so he extended his road on to Miami, and as a result there has been a general movement of citrous fruit-growers to South Florida, and so far results have justified the move. While Miami is built on a coral formation, and much of the country about might be said to have more rock than soil, it is Mr. Flagler's theory, apparently borne out by facts, that the climate has more to do with fruit and vegetable growing than soil, anyhow. He tells of having his gardner fill one box with broken stones and another with rich soil, in which the same vegetables were planted, and that both grew equally well. He also relates having seen a man near Miami blasting holes in the rock, in which he planted orange trees, and they got along all right.

In addition to the great hotels at Atlantic Beach, St. Augustine, Ormond, Palm Beach and Miami, Mr. Flagler has built a million-dollar "cottage," "White Hall," on the shores of Lake Worth, at Palm Beach, and here he proposes to spend much of his time. Doubtless he would rather remain in this peaceful, dreamy clime than anywhere else, for it is impossible to conceive of a more favored spot or a more attractive home. But had much that he has done been simply designed for advertising purposes, the end might justify the means for that consideration alone. He has shown, by his hotels and grounds and by his own home, what a heavenly place Florida can be made, and with a little effort and some money, how every vestige of the wilderness can be banished. He has provided a veritable land of enchantment, "where summer sings and never dies," and when one has once known those bowers of flowers and groves of palms, has in dead of winter listened to the song of birds and felt the soft wind as it lazily rustled by, has looked on that wonderfully blue sky and into the crystal depths of the tepid Southern sea, the spell cannot be broken, and if he do not return there to live, the glorious memory of it all will haunt him till he dies.

ALBERT PHENIS.

SABINE PASS DEAL.

Reported Purchase of Water-Front by John H. Kirby.

[Special Cor. Manufacturers' Record.]

Beaumont, Texas, February 17.

The largest trade item by far to Texas in general and Southeast Texas in particular is the purchase of the bulk of the Sabine Pass water-front by Mr. John H. Kirby. This property has been owned by the Kountze brothers of New York city, and they have been the possessors of this property for something like thirty years. When it was first bought the water had a depth to the sea of five feet, but by continually hammering away from the citizens of Beaumont particularly this depth was increased to twenty-seven feet, until the great Galveston storm came and it was filled in somewhat, and now they are asking an appropriation of $180,000 for the purpose of cleaning it out again. With this property in Mr. Kirby's hands it is thought that the depth will be maintained and that the influences at Washington will be stronger than ever to that end. The price must have been in the neighborhood of $2,500,000 if all the property was taken in. A report has been circulated to the effect that the Standard Oil Co. had made this purchase, but it is without foundation.

The work on the large Burt refinery was started this week, and the track to the site was also commenced. The refinery will have a capacity of 2000 barrels at first, but will be arranged so that this may be doubled as the trade warrants. The number of men employed by the refinery and the shops in connection with it will be 750 under the 2000 capacity and 1500 if it is increased.

The Guffey Company at Port Arthur is also starting in another addition, or a separate and complete refinery, being its No. 3. It is said that it will be the largest in the world.

The work on the Forward refinery at Orange is also going ahead rapidly, and should be finished in ninety days more.

The principal event of the week in lumber has been the final closing of the deal for $25,000 by Mr. John H. Kirby, individually, for the pine-timber lands of the Nona Mills Co. of Texas. These are virgin long-leaf yellow-pine lands of San Augustine, Sabine and Angelina counties, and it is said to be the best timber left in the State. Mr. Kirby will, it is thought, take immediate steps to place saw-mills there in the belt. The Santa Fe extension that is being built from Beaumont north will penetrate this timber and give it an available market. The Nona Mills Co. of Texas bears no connection with the Nona Mills Co., Limited, that is now operating a very large saw-mill in Louisiana at Leesville, though the stockholders of the two concerns are the same.

The Kirby Lumber Co. made another big purchase a few days since, when it bought the saw-mill at Devers and 43,000 acres of pine timber just to the north of Liberty county. This is also a very large purchase, but the amount of the consideration could not be learned.

Interest in Oil for Fuel.

As illustrating the increasing interest in oil for fuel is a letter from Mr. D. T. West of Charleston, S. C., to the Manufacturers' Record as follows:

"Having been referred to you for information, will you kindly let me know the names of any concerns making hot-water boilers using fuel oil for heating. My business is planting and growing berries and vegetables, etc. I contemplate putting in some hot-water pipes, and believe that fuel oil will answer my purpose, but do not know of a single concern making boilers using fuel oil."

OIL NOTES.

Facts About Petroleum and Its Uses.

A dispatch from San Antonio, Texas, says that the San Antonio & Aransas Pass Railway has placed an order for six steel oil tanks to supply fuel to the engines on the road. Two of the tanks are to be of 55,000 barrels capacity each, and the other four of 30,000 barrels each.

The Penman Tank and Iron Works of Beaumont has effected permanent organization with W. H. Penman, president and general manager; H. B. Stati, vice-president; R. C. Duff, secretary, and J. F. Keith, treasurer. The facilities that this $125,000 company will afford will assist largely in developments in the field. It is said that contracts for twenty-four steel tanks to cost $228,000 have already been signed with the Southern Pacific Railway, which is utilizing in all its departments the advantages which Beaumont oil offers as a fuel. The Penman plant includes the removal of an establishment that was conducted successfully at East Chicago, Ind., for some years.

A dispatch from New Orleans says that New Orleans men are interested with President W. J. Kelly of the Warrior River Coal Co. of Alabama in the incorporation of a line of barges to operate from tidewater on the Warrior river at the Tuscaloosa coal mines to New Orleans by way of the Lake Borgne canal.

State Geologist Earle Sloan of South Carolina, in submitting his first annual report, lays special stress upon the necessity for investigations leading to the profitable development of the kaolin and clay deposits which exist in valuable extent in nearly every county of the State.

AMERICANS IN MEXICO.

Influence of Ideas and Capital from the United States.

Though the present number of natives of the United States resident in the republic of Mexico is but 10,000, Americans are yearly increasing in number there. American capital is becoming more deeply interested there, and, according to the annual report of United States Consul-General Barlow of the City of Mexico, American ideas are becoming quite dominant in many respects. He writes to the State Department:

"Narrow and dirty streets are being superseded by broad asphalted avenues, paved largely by American companies, and beautiful macadam drives, rolled by American steam street rollers and made of stone crushed by American machinery. Street-sprinkling carts are coming into use, and gangs of men are being employed to keep the streets clean. A great canal, built for the purpose of draining the city and furnishing an outlet for its sewage, carrying off the water after the abundant rainfalls of the rainy season and furnishing an outlet for the neighboring lakes, thus preventing the possibility of a recurrence of the former disastrous floods, has been completed a little over a year. A sewerage system covering the entire city is to be finished within the present calendar year.

"Parks are being improved and beautified by competent men. Shade trees are being planted. Plazas or public squares, where the lower classes congregate in great numbers, are being improved.

"The city is one of the best lighted in the world. One of the electric-light companies is American, and another firm is now laying light and power cables.

"Over fifty miles of electric street railroad have been built and put in operation in this city within the past two years, and fifty miles more will be in operation a year hence. All of the material for this street railroad has come from the United States save the boilers for the power-house.

"Automobiles of American manufacture are quite numerous on the streets and in the parks. The private carriages of the wealthy residents are equal to those of any city in the world. Many of the carriages and most of the teams have been imported from the United States.

"Modern business blocks, built on the American plan, are being erected, and public buildings with American conveniences are replacing the relics of past generations. Amrican apartment-houses are taking the place of the old Mexican 'vivienda' buildings, and are proving to be splendid investments. Some years ago the resident Americans began to build houses in a part of the city then but sparsely settled. This section is now the most desirable residence portion, and land in the vicinity commands higher prices than anywhere else, having increased in value as much as tenfold within the past twenty years. It cannot be said yet that American houses are superseding the Mexican ones, but conveniences, such as bathrooms, closets, kitchens with iron stoves and ranges, grates in living-rooms, oil and gasoline stoves, electric lights and bells, etc., are being rapidly introduced into Mexican houses, and practically all are imported from the United States. The old patio style of house—with a large court in the center, around which are built the rooms—which is intended for hot countries and is wholly unsuited to this climate, is being slowly but surely encroached upon by the compact American structure, and this is bound to be more noticeable as land values rise.

"Within the present year some $10,000,000 Mexican currency has been appropriated by the federal and municipal governments for improvements in this city. An entire block has been purchased for a site for a national theater, and the demolition of the buildings thereon has already begun. The middle of an adjoining block has been purchased, and the buildings, including the old National Theater, have already been removed for the purpose of extending the avenue of the Cinco de Mayo—one of the broadest and handsomest streets of the city—through from the cathedral to the new theater. A new palace of justice is being built; a magnificent post-office is soon to be begun; fine buildings for the geological department, recently established, are being constructed; the national palace is being thoroughly renovated, and many other improvements are being considered by the federal and municipal authorities. Great activity is noticed in all building lines."

Referring to trade relations, Mr. Barlow writes:

"The most important single line of trade, and that which shows the largest amount of imports, is in machinery and machinery supplies. This is practically controlled by Americans. The hardware trade, which is a good one, is largely in the hands of the Germans, though in the past few years American hardware has been making deep inroads into the German imports in this line. While the large hardware stores are run by Germans, all of them now carry large lines of American hardware. The dry-goods trade, which is next in importance after the machinery trade, was controlled early in the last century by the English, and later by the Germans, but is now controlled by the French. Imports of American dry goods are increasing, however, and they are found in most of the large stores. The grocery trade is controlled by Spaniards, and their monopoly of this line is almost absolute. There is one American wholesale grocery store and a few small retail stores, but these exist mainly to supply the trade of the resident Americans. There appears to be no large field for imports for American groceries in Mexico, the demand being mostly from resident Americans and a few Mexicans who have lived for some time in the United States. Imports of California wines have been steadily increasing in the past few years, as have also imports of American fresh fruits.

"The principal employment of the American residents here is in the operation of the railroads. The Americans in Mexico may be said to have come with the railroads, and have ever since practically operated them. Aside from the machinery trade, the Americans are pre-eminent in no other line. There are a few American stores of various kinds in the city, but they supply mostly the trade of resident Americans. Two American furniture stores do a large business. One manufactures furniture here, while the other imports it from the United States. American shoe stores have a small trade among the better class of Mexicans and foreigners, as well as Americans. An American shoe factory is now in course of construction in this city.

"One urgent need of the city appears to be a hotel conducted on American lines. The hotels and restaurants of the city are poor, especially as to service. Whether or not it is possible to manage a hotel according to our standard with profit is problematical, but there is no doubt that the tourist travel to this city and republic would be greatly increased if there were better hotels.

"It should be said that the stores of this city are large and well arranged, and some of them carry enormous stocks. The appearance of the stores is excellent, and their show-windows compare favorably with those of any American city. As a rule, the large houses are well and conservatively managed. Failures in business here are far rarer than in the United States."

American capital is largely represented in transportation interests. Mr. Barlow writes on this point:

"Numerous changes in the ownership and management of Mexican railroads have taken place within the past year. The Mexican Central Railroad, the most important system in the republic, has recently passed into the control of a group of capitalists identified with the Standard Oil Co. interests. No radical changes in the management of the road have yet been made, and it cannot be positively stated that there will be. What is more important to Mexico is that with stronger financial backing the road is certain to be greatly improved in every line. The extension of the Colima branch to the port of Manzanillo is being pushed rapidly, and will probably be finished within two years. In this connection work on the port works at Manzanillo, under the direction of Edgar K. Smoot, is progressing satisfactorily, and the harbor will probably be finished by the time or soon after the railroad reaches the port. The advantages to Mexico of this transcontinental connection are obvious. The extension of the road during the year ended December 31, 1900, was as follows: On the Zamora extension, 22.58 miles, between Chavinda and Tarecuato; on the San Marcos extension from La Vega, on the Ameca extension, to San Marcos, 29.37 miles; the Parral line, between Parral and Adrian, 12.03 miles, and a branch from Adrian to Santa Barbara, 5.46 miles—making a total of 69.44 miles. The total mileage of the road on December 31, 1900, was 2124.4; mileage of side tracks, 227.53—total, 2351.93 miles. Since December 31, 1900, work has been in progress on the Zapotlan extension, which is now nearly completed to Tuxpan, 115 miles from Guadalajara. The Parral extension has been completed to El Rosario, a distance of ninety-seven miles, and the Rio Verde extension has been completed from San Bartolo to Rio Verde, a distance of twenty-five miles. During the year ended December 31, 1900, 93.01 miles of track were ballasted, making a total of track ballasted within the past six years of 265.11 miles, at a cost of $938,141.21 Mexican currency.

"The Mexican National Railroad, a narrow-gauge road from Laredo, Texas, to this city, has recently passed into the control of New York capitalists, and the change to a standard-gauge road is now practically assured. The cost of this work is estimated at $10,000,000 in United States currency, and it is believed that $7,500,000 of this amount will be spent in the United States for equipment and material. It is expected that work on the broadening of the gauge will begin in a few months. The Mexican International road, from Eagle Pass to Torreon, on the line of the Mexican Central, has also passed into the hands of the same interests which control the Mexican National, and extensive improvements on this road, especially in the matter of rolling stock, are promised.

"Some construction work has been done in the past few months upon the Kansas City, Mexico & Orient Railroad, a proposed road from Kansas City to Port Stilwell (formerly Port Topolobampo), on the Gulf of California. The same interests, commonly known as the Stilwell interests, have recently acquired the Pachuca, Zacualtipan & Tampico Railroad. A few miles of this road have been built for some years from Pachuca toward Zacualtipan into a rich iron-mining region. The concession for the road carries with it a liberal subsidy for construction from the Mexican government, and the proposed line of the road is said by engineers to be the most feasible route to Tampico. It is intended to use the line of the Mexican (Vera Cruz) Railroad from Pachuca to this city—temporarily at least. The road, when completed, will give almost an air line from this city to Tampico.

"The Mexican government has recently let a contract to a Chicago firm to build a canal from the port of Tuxpan to Panuco, on the Panuco river, ultimately connecting with Tampico. Some New York capitalists recently obtained an option on the Hidalgo Railroad, a narrow-gauge road running from this city with the ultimate destination of Tuxpan. At the time the option was held by these capitalists, the Mexican government agreed, as an inducement to the completion of the road to Tuxpan, to build a harbor at Tuxpan. The deal fell through, however, and nothing definite has been done since, though several American capitalists are said to be considering taking the road.

"The work on the Vera Cruz & Pacific Railroad from Cordoba, on the line of the Mexican (Vera Cruz) Railroad, to San Juan Bautista, on the line of the Tehuantepec National Railroad, is progressing satisfactorily, and will probably be finished within two years. Work on the Tehuantepec National Railroad and upon the port works at Coatzacoalcos and Salina Cruz, which ports the railroad will connect, is also progressing rapidly, and will be finished within the next two or three years. As an overland transisthmian route, this railroad will be of immense importance to American shipping when completed. Much work is being done on the Mexican Southern Railroad, a narrow-gauge road from Puebla to the city of Oaxaca, in the way of improving the roadbed, putting in breakwaters (the road runs along a canon in which mountain torrents are sometimes very destructive), bridges, etc. The roadbed is now one of the best in the republic, and the road is in a prosperous condition. An extension from the city of Oaxaca to Ocolan, in the center of a rich mining district, is nearly ready to be put in operation. An electric line from Tehuacan, on the line of the Mexican Southern, to Esperanza, on the line of the Mexican (Vera Cruz) road, has recently been built. No construction work has been done in the past year on the Mexico, Cuernavaca & Pacific Railroad, which runs from this city to the River Balsas, with an ultimate destination of the port of Acapulco or the port of Zapote, on the Pacific coast.

"An electric road has been placed in operation within the past year from Torreon, on the line of the Mexican Central Railroad, to Lerdo, running through a rich cotton and agricultural district. A concession has recently been granted to a company of American and Mexican capitalists to construct an electric line around this city, connecting its suburbs. Some American capitalists have recently visited the republic to investigate the possibilities of putting electric street railroads in several of the larger cities of Mexico, but as yet no steps have been taken toward securing concessions for their construction."

The sales in the Joplin (Mo.) district during the week ended February 15 were 8,867,140 pounds of zinc ore and 828,220 pounds of lead ore, valued in all at $144,829.

BENEFITS VIRGINIA FARMERS.

Practical Work of the State Polytechnic at Blacksburg.

Editor Manufacturers' Record:

As a result of a conversation we had on the train some time since about industrial development of the South, you requested that I write you with reference to the work done by the Virginia Polytechnic Institute at Blacksburg for the practical advancement of the farming interests of the State. Being interested in farming, more particularly apple orchards, I reap the benefit of the aid of the institution.

This college is supported by the endowment received from the Morrill land-grant act, which contributes about $21,000 a year, and also has from the second Morrill act $15,000 a year; then the agricultural experiment station is an adjunct to the college, and receives from the Hatch act $15,000 a year. The first item mentioned comes as interest paid by the State on the endowment which was converted into the State treasury. The other items come direct from the United States treasury.

The college covers the whole field of industrial education, so far as there has been any demand for such training in Virginia. That relating distinctly to agriculture may be classed under the head of general agriculture, which comprises the study of the whole detail of farm management, preparation of soils, rotation of crops, drainage of land, the breeding and handling of stock, the management of dairy work, the study of orcharding and small-fruit growing, with also vegetable gardening, and the study of fungus diseases and injurious insects attacking plants, and there is also a veterinary department, which applies itself to the study of diseases of animals.

The above expresses in epitome the opportunities offered the student, but you will probably be more concerned with those phases of the work which appeal directly to the general public.

It maintains herds of Shorthorn, Polled Angus, Holstein, Jersey and Guernsey breeds of cattle, which are handled in the best modern, scientific manner, and farmers, dairymen or anyone specially interested in these lines of work are given the largest opportunities to examine the college methods, and all the increase of the herds not desired for the institution are sold at very moderate prices, hoping thereby to help raise the standard of the cattle in the country.

In connection with this stock work, they have the finest and best equipped barns south of the Potomac river, in which the handling, feeding and general care of stock of all grades, from the calf to the finest-bred stock cattle, can be observed and studied by the farmers at will.

The institution also handles Dorset sheep, Berkshire and Poland-China swine in the same manner, and disposes of the extra stock to the farmers in the same manner.

The dairy department is run so as to furnish a very excellent illustration of the handling of milk, keeping of records as to dairy cows, the disposal of this milk as whole milk, butter and cheese. This work is also open to the fullest inspection of every farmer, and students are accepted for practical training in any lines of work mentioned above, giving them every facility for learning the technique and handling of these subjects practically without any cost other than their personal expense.

The veterinary department offers in the way of matter available to the farmers and non-students almost daily clinics on diseased domestic animals, where the animals are examined and prescribed for free of charge, except in case medicines are issued, when the actual charge for cost is made; and the veterinarian and his assistant travel to all parts of the State to observe and treat the outbreaks of disease and maintain quarantines to restrict the transportation of animals which are diseased and liable to scatter disease into uninfested districts, and to otherwise aid the farmer in caring for his stock, and to give him a better understanding of the diseases incident to the same.

In horticulture as a general subject, large plantations of fruits are constantly maintained in good order for observation and aid of anyone interested in the subject. These include hundreds of varieties of large and small fruits, and illustrate fully the methods of culture, pruning, spraying, etc.

There is also in the same department a factory for the canning and preserving of all manner of by-products from fruits, and the making of ciders, jellies, vinegar, etc. This work is always open to anyone who wishes to enter as a working apprentice, and the full details of the work are taught by actual practice without cost to the person desiring to take the same. In this I am speaking of non-students of the college or the general public.

The horticultural department also attempts to deal with these subjects in the State, inspects lands for the purpose of determining their adaptation to fruit culture, gives advice and direction for the selection of varieties, the planting of the same; in fact, undertakes to lay down plans for the furtherance of ordinary work in orcharding or small-fruit growing, charging for this work only the actual cost involved in preparing the details and giving the advice desired.

This department also investigates the fungus diseases of plants throughout the State, and illustrates the use of machinery and preparation of spray mixtures and the actual field work of application, so as to instruct the farmer in those methods that will best protect his fruit crops. The same is true of investigation and dealing with insect troubles.

Then in a more special sense the horticultural department has charge over the inspection laws of the State that deal with the dangerously injurious diseases and insect pests of plants, and in this work it maintains a strict control over the nurseries in the State, so as to prevent them disposing of or scattering plants infested with dangerous fungus diseases or injurious insects, and also maintains an oversight over all plants coming into the State, so as to in like manner prevent the dissemination of these troubles by nurserymen from outside the State. In this work the officers travel over the entire State, giving personal direction to the matters which concern the vastly important fruit interests of the State. So far as relates to all this horticultural work and dealing with the strictly injurious pests, it is performed without charge to the citizens, but the actual treatment of private premises is not undertaken without the individual pays the expense of the same.

In this work the officers of the horticultural department travel from 10,000 to 12,000 miles per year in the State, and spend six to eight months' time giving oversight to the lines of work mentioned.

As a result of this sort of work for the past thirteen years I think I can safely say that the character of technical work in fruit-growing has entirely changed in the State of Virginia, and that our people are now adopting the modern and approved methods, with the result that many are making large profits from their crops.

In the matter of the study of the by-products of fruit, they are now giving information, and will be better able to give the same in the future, which will enable our people to make the by-products of their orchards pay the entire expense of cultivating and handling the same in the most approved manner, and the fruit of merchantable grade be entirely clear profit. Some growers have already reached this result.

I made no reference to the mechanical department of this institution, as I understood your request to be confined to the agricultural department. I regret that business engagements have delayed my writing sooner.

JOHN D. HORSLEY.

Lynchburg, Va.

Notes at Huntsville.

[Special Cor. Manufacturers' Record.]

Huntsville, Ala., February 19.

Armour & Co. of Chicago, who have been running a branch house here for the past three years, have succeeded to such an extent that they are now planning to buy a lot near one of the railroads and erect a large cold-storage warehouse.

The Southern Handle Co., M. R. Grace, president, is figuring on installing its own electric-light plant in order to meet the heavy demand of business, which necessitates night runs.

For the past quarter of a century a good grade of bituminous coal has been mined on Monte Sano, three miles from this city, and hauled here in wagons and sold to our citizens. The general belief now is that this supply is quite extensive, and of a better grade than the outcroppings indicate. It is reported that a company will soon be organized to develop these mines.

Norfolk's Proposed Shipyards.

Northern and Western capitalists interested in the Norfolk Shipyard & Dry-Dock Co. held a meeting at Norfolk, Va., this week to further plans for commencing the construction of the plant. It is stated that a capital of $2,000,000 is now available, and that the erection of the necessary buildings will be commenced within two months.

Owing to a similarity of names with another company, the corporation will change its title to the Hampton Roads Shipyard & Dry-Dock Co., and John McInnes, superintendent of one of the largest shipyards at Bath, Maine, has been chosen superintendent of the proposed plant.

The plant is to have sixteen buildings, a majority of them constructed of brick, and some of sheet iron, to include powerhouse and machine shop, shipwright shop, inside shipfitter and machine shop, shipsmith shop, plumbers and pipefitters' shop, pattern shop, foundry, sparmakers' shop, etc. The site is a tract of 703 acres fronting 5000 feet on the Elizabeth river, 100 acres to be used for the shipyard proper, and the balance has been surveyed into building lots. One marine railway will have a capacity of 500 tons; another will have capacity for 1000 tons. Electric cranes will traverse the yards, and in the center of the water frontage there will be a floating dry-dock with a capacity of 15,000 tons, said to be of a sufficient size to accommodate any vessel in the United States Navy. This dock will be built on the sectional plan, which provides for indefinite enlargement.

Among those interested are ex-Governor Geo. W. Atkinson of Charleston, W. Va., who is president; Messrs. George Blackistone, president of the Union Trust Co. of Baltimore, Md., who is vice-president; Caldwell Hardy of Norfolk, who is treasurer, and C. W. Tebault of Norfolk, who has been the active promotor in furthering the interests of the enterprise.

Referring to the enterprise ex-Governor Atkinson writes to the Manufacturers' Record in part as follows:

"A three-million dollar enterprise is on foot in the shape of a shipyard at Norfolk. A large part of the stock has been subscribed, but not enough yet to organize the company. We have every reason to believe, however, that a sufficiency of stock will be secured at an early date, and that the company will be organized and work begun. Norfolk is regarded as an ideal place for such an enterprise, and all we lack is a sufficiency of time to present the matter to men who have the surplus means on hand to secure the required amount of stock. Everything indicates that it will be a go, and at an early date."

Georgia Pyrites.

Mr. Eugene Sheridan of New York writes to the Manufacturers' Record as follows:

"I would call your attention to a mining industry in the South that may eventually reach great proportions and be of the greatest value to the fertilizer and kindred industries in that section. It is the development of a pyrite mine, 335 acres in extent, in Carroll county, Georgia.

"Development work has been going on quietly on this property for about ten months, and the richness of the ore in sulphur is such that it places it on about a par with the Spanish ore. The highest assay showed 49.46 per cent. sulphur and 84 gold per ton. This assay was made some months ago, but at the present moment the engineer says it will certainly run 50 per cent. sulphur. The vein is now about twelve feet wide, of different grades, but the high-grade ore is some six feet wide, and the vein grows wider and wider as they go down.

"The development has now reached a stage that the first carload will possibly soon be shipped to Atlanta. It is said that the development of the mine is watched with much interest by users of pyrites South. Mr. C. F. Durr, Buchanan, Ga., is the mining engineer who is developing this mine."

A $100,000 Copper Mining Company

Announcement was made recently of the incorporation of the Cullowhee Copper Co. of Cullowhee, N. C., with capitalization of $100,000. The company has since effected permanent organization, and Secretary Thos. A. Cox writes the Manufacturers' Record giving full particulars as to its plans. Two valuable copper properties, the Cullowhee copper mine of 400 acres and the Alice copper mine of 640 acres, have been purchased, and thorough developments will be instituted immediately. It is proposed to sink a shaft several hundred feet deep, and proposals are now invited for considerable of the machinery necessary for that purpose and for otherwise handling the ores. Later on the company expects to erect a smelting and refining plant to prepare the ores for the market. The properties purchased were originally opened about 1860, but after several years of successful operation mining ceased, and until recently the property was in litigation, when the United States Court passed a clear title so that the present owners could buy it. Besides Mr. Cox, the officers are D. D. Davies of Cullowhee, N. C., president, and R. E. Bowen of Easley, S. C., treasurer.

The city of Galveston has paid interest on $300,000 of its 5 per cent. sewer bonds.

RAILROADS.

[A complete record of all new railroad building in the South will be found in the Construction Department.]

To Build 1426 Miles.

Among the latest railroad projects of the Southwest is the Denver, Kansas & Atlantic Railroad, chartered at Guthrie, Okla., to build 1426 miles of road from Denver, Col., into Arkansas. The line as planned is to run from Denver southeast to Marshall, Okla., thence via Oklahoma City through the Seminole, Chickasaw and Choctaw Nations to Paris, Texas, with a branch from Coalgate, I. T., northeast via South McAlester to Fort Smith, Ark.; another branch from near Stringtown, Choctaw Nation, via Antlers and Eagletown to Texarkana, Ark.; another branch from Marshall via Guthrie, Shawnee and Tecumseh to a point on the Red river. The capital stock is to be $15,000,000, and the incorporators are Smith H. Mallory of Chariton, Iowa; J. H. Cameron, Albert E. Yerkes and S. D. Cook of Chicago, J. S. Cooley and J. M. McCormick of Oklahoma City, L. N. Van Horn of Salt Lake City, T. C. Lindley of Medicine Lodge, Kan.; H. K. Bickford of Alva, Okla., and J. M. Bickel of Spring Vale, Kan.

President John M. Hood.

The selection of President John M. Hood of the Western Maryland Railroad Co. as the president of the United Railways & Electric Co. of Baltimore will bring to the latter company the services of a man who has had long experience not only as a civil engineer, but as a practical railroad man, and whose great administrative capacity has been demonstrated in his conduct of the Western Maryland Railroad during the past quarter of a century. Though his career in that connection has been a quiet one, its results have been most effective, and under his administration the business and importance of the Western Maryland has steadily grown.

A Western Carolina Road.

Mr. John S. Verner of Columbia, S. C., informs the Manufacturers' Record that it is hoped to complete the French Broad & Southern Railroad, in which he is interested, during this year. The road surveyed extends from Toxaway, in the mountains of Western North Carolina, where it will connect with the Transylvania Railroad, to Oconee county, South Carolina, tapping the Southern Railway at a point between the Chauga and Keowee rivers. The road is about fifty miles long, and it is estimated that it will shorten the present road from Atlanta and the South to Asheville and the highlands of North Carolina about one-third.

A Y-Shaped Mississippi Line.

A charter has been granted in Mississippi to the Alabama & Mississippi Railroad Co., which proposes to construct a three-pronged line centering at Leakesville, Miss., with one branch running eastward until it touches the Mobile & Ohio Railroad in Alabama, a second running northwesterly to Ellisville, and a third running southwesterly to the Gulf & Ship Island Railroad, and thence to Napoleon, on Pearl river. The proposed line would run through the lumber region of Southern Mississippi.

Brooksville & Hudson.

President John J. McDonough of the Brooksville & Hudson Railroad informs the Manufacturers' Record that the total mileage of the road, when completed, will be about forty-two miles. Thirteen miles are now in operation, and contracts have been let for the rest of the work, which is being pushed to Hudson and other points.

Pushing to Completion.

Mr. H. M. Strong, president of a company which is building a railroad between Grand Saline and Alba, Texas, a distance of ten miles, reports that the road will be open for traffic within sixty days, and that under certain contingencies eighteen additional miles will be built at once.

Railroad Notes.

Work has begun on the Jamestown, Williamsburg & Yorktown Electric Railroad in Virginia.

It is stated that the Illinois Central Railroad will plant about 20,000 catalpa trees along its system as sources for a supply of crossties.

Contract has been awarded by the Baltimore & Ohio Railroad Co. for the erection of a steel bridge across Buffalo creek, a short distance below Fairmont, W. Va.

It is announced that the Richmond, Fredericksburg & Potomac Railroad contemplates straightening its line in Caroline county, Virginia, by which three miles of the route will be saved.

The Southern Pacific Railway is using moving pictures to illustrate lectures in the Middle West and the Northwest, setting forth the resources and general conditions of Louisiana and Texas, especially those bearing upon the rice industry.

It is understood that the syndicate behind the Berwyn & Laurel Electric Railway in Prince George's county, Maryland, has control of the City & Suburban Railway of Washington, D. C., thus ensuring a direct trolley line between Laurel and Washington.

It is believed at Saltillo, Tenn., that Indianapolis capitalists will back the project for a construction of a trolley road from Saltillo to the Shiloh battlefield, and thence to Corinth, Miss., a distance of ninety miles. The route of the proposed road is through a fine farming and timber section.

A dispatch from Richmond, Va., says that the entire stock of the Brook Turnpike Co. has been sold to N. W. Bowe, representing persons whose names have not been made public. The company has authority to build and operate either a turnpike road or a railroad from Richmond to Charlottesville.

A dispatch from Chicago states that Vice-President J. T. Harahan of the Illinois Central Railroad will spend several weeks in Cuba for the purpose of furthering the business of the railroad with the island, and that perhaps his visit may result in the establishment of a line of steamers between New Orleans and Cuban ports.

Mr. Charles L. Betterton, secretary of the Nelson Construction Co. of El Paso, Texas, writes to the Manufacturers' Record that the work of reducing the grade of the Southern Pacific Railroad system from Rogers, New Mexico, to Strauss, New Mexico, a distance of fourteen miles, is to be completed by midsummer, and that it will cost about $500,000.

It is announced that the first of four steamboats for the new Fayetteville & Wilmington Steamboat Co. will be finished at Jacksonville, Fla., within the next six weeks, and will immediately be put into service for passengers and freight between Fayetteville and Wilmington, N. C.

TEXTILES.

[A complete record of new textile enterprises in the South will be found in the Construction Department.]

Correspondence relating to textile matters, especially to the cotton-mill interests of the South, and items of news about new mills or enlargements, special contracts for goods, market conditions, etc., are invited by the Manufacturers' Record. We shall be glad to have such matter at all times, and also to have any general discussion relating to cotton matters.

To Bleach, Dye, Mercerize and Print.

Another step forward, and an important one, in the progress of the Southern textile industry is seen in the announcement of the intention to establish a complete modern plant for finishing fine cotton goods at Gaffney, S. C. The particulars concerning this enterprise and the first definite announcement are conveyed to the Manufacturers' Record in a telegram from Mr. H. D. Wheat, president of the Gaffney Manufacturing Co., one of the most successful cotton manufacturers and operating one of the largest plants in the South.

Mr. Wheat states that work has commenced on the construction of the necessary buildings, which will include a structure two stories high, 100x350 feet in dimension, for accommodating the principal portion of the machinery. This latter will include a complete modern equipment for bleaching, dyeing, mercerizing and printing yarns and piece goods, which will make this the only plant of its character in the South. It is understood that about $200,000 will be invested in these improvements.

Mr. Wheat also states that the company is changing its mill from plain to fancy weaving, its product heretofore having been plain print cloth. The equipment now in position numbers 62,000 spinning spindles, 5040 twisting spindles and 1401 Draper looms.

A 10,000-Spindle Mill.

Announcement was made last December of the Milstead Manufacturing Co. as organizing to build a $200,000 cotton factory near Conyers, Ga. Permanent organization has since been effected with A. J. Milstead, president; H. Y. McCord, vice-president; F. D. Milstead, secretary-general manager, and John H. Almand, treasurer. They, with Messrs. Frank Hawkins, J. C. Payne and L. J. Almand, are the directors. Messrs. Hall Bros. of Atlanta have furnished plans and specifications for the company's developments, and the water-power development work is to be commenced soon. The president of the company was for many years president of the Tallassee Falls (Ala.) Manufacturing Co., and is well qualified to make a success of this enterprise. The spindles will number 10,000.

The Cotton Movement.

In his report for February 14 Col. Henry G. Hester, secretary of the New Orleans Cotton Exchange, shows that the amount of cotton brought into sight during the 167 days of the present season was 8,260,154 bales, an increase over the same period last year of 352,554 bales; exports were 4,843,086 bales, an increase of 695,591; takings by Northern spinners, 1,464,055, an increase of 17,321 bales; by Southern spinners, 931,355 bales, an increase of 109,055 bales.

Textile Notes.

Young Men's Business League of Waco, Texas, is endeavoring to locate a knitting mill.

The City Club of Oklahoma City, O. T., has a proposition for the location of a cotton factory of 8000 spindles and 150 looms.

It is rumored that the Burnett & McKee Company of Vicksburg, Miss., is contemplating to arrange for erecting a cotton factory.

It is reported that Ettrick Manufacturing Co. of Petersburg, Va., will expend the $50,000 for improvements recently reported as contemplated.

John J. Marsh of North Adams, Mass., writes the Manufacturers' Record that the report as to his intention to build a cotton mill at Charlotte, N. C., is a mistake.

Messrs. S. B. Griswold and Mr. Harrington of Carthage, Mo., are forming a company to operate the Carthage Woolen Mill, adding to it a cutting and clothing department.

Columbia Manufacturing Co. of Ramseur, N. C., is reported as to make some extensive improvements, possibly remodeling the entire plant of 12,000 spindles and 850 looms.

The establishment of a silk mill is talked of at Littleton, N. C., and H. J. Cordle is interested. Mr. Cordle is desirous of corresponding with makers of the necessary machinery.

Shelby (N. C.) parties are negotiating to operate the Lauraglenn Mills in their city, which was sold recently at court sale to John E. Hurst of Baltimore, Md. It is a 2800-spindle plant.

Enoree (S. C.) Manufacturing Co. will increase capital stock from $400,000 to $700,000, but for what purpose is not stated. Company now has a mill of 30,720 spindles and 902 looms.

Lancaster (S. C.) Cotton Mills continues to push the work of completing its No. 2 mill, and expects to begin operations in it this year. The equipment will be 53,000 spindles and 1200 looms.

B. B. Paddock of Fort Worth, Texas, states that the knitting mill for which he has been reported as negotiating will probably be secured. However, no definite conclusion has been reached yet.

It is reported the Opelika (Ala.) Cotton Mills will install 1250 additional spindles for producing coarse yarns. Company now has 6500 spindles. Sufficient power and space for these spindles is at hand.

The citizens of Jefferson, Ga., have held a meeting to further the proposed movement to organize a cotton-mill company. Messrs. T. D. Rowell and W. S. Haywood are moving in the enterprise.

J. D. Hagler, vice-president of C. T. Herring Banking Co., Vernon, Texas, has a proposition from a Northern manufacturer to locate a $50,000 cotton factory if local parties will give a $10,000 bonus.

Capelsie Cotton Mills of Troy, N. C., is to install a 130 to 150-horse-power Corliss engine, and is now asking for estimates on a second-hand machine. Twenty-five hundred spindles are operated at present.

It is probable that a stock company will be formed to build a knitting mill to replace the Riverview Knitting Mills, recently burned at Tarboro, N. C. John F. Shackleford was proprietor of the plant destroyed.

There is talk of a cotton-batting and comfort mill for erection at Washington, N. C., and J. Havens is interested. Mr. Havens is desirous of corresponding with makers of the machinery required for such a mill.

R. J. Fisher of Athens, Tenn., will establish a knitting mill. He has leased suitable building, and will install thirty knitting machines and thirty-two ribbers for a production of women's and chil-

dren's ribbed hosiery. Steam-power will be used.

Messrs. J. A. Martin, J. L. Latta and T. J. Lutz of Hickory, N. C., and J. R. Gaither of Newton, N. C., have incorporated Catawba Woolen Mills Co., with capital stock of $6000, for manufacturing woolen goods.

Gaffney (S. C.) Carpet Manufacturing Co. has ordered 100 additional looms for installation in its carpet mill, now operating thirty-one narrow and nine broad looms. The new looms will manufacture colored goods.

Shamrock Knitting Mills of Winston, N. C., is reported as to increase its equipment of machines. This company recently established its plant, operating 100 machines, and manufactures hosiery from Egyptian yarn.

Robert Lucas and associates of Anniston, Ala., contemplate establishing a cordage mill, and have obtained options on suitable buildings. They expect to form company and install equipment for making cotton rope, twine, batting, etc.

Paducah (Ky.) Textile Co. has been incorporated, with capital stock of $20,000, and will operate the Alden Knitting Mills, recently leased to Messrs. R. B. Phillips and Geo. C. Wallace. One hundred knitting machines are to be added to the eighty-one that were in position.

The Colleton Cotton Mills of Walterboro, S. C., has decided on the erection of a four-story building 65x75 feet in dimension, and is asking contractors to submit estimates on its construction. Probably machinery is to be installed in the addition. Company now has 5000 spindles and 136 looms.

Bemis Bros. Bag Co. of St. Louis, Mo., has filed notice of increase of capital stock from $1,600,000 to $3,200,000. This company is known as an extensive manufacturer and dealer in bags. It controls the Jackson (Tenn.) Fiber Co., mentioned recently as enlarging its plant at a cost of about $100,000.

Messrs. William H. Kimball and son, W. C. Kimball, have decided to establish a knitting mill, having made thorough investigations as to the industry both North and South. They have ordered machinery for the production of the finer grades of children's and women's hosiery, and expect to operate by April 1.

Orr Cotton Mills of Tarboro, N. C., is reported as to erect a No. 2 mill, to contain 25,000 spindles. The No. 1 plant is about to resume operations, a steam plant being almost ready for operations. It will be recalled that damage to the water-power plant at Anderson forced this company to install a steam plant temporarily.

The Chronicle Mills of Belmont, N. C., writes that its plant, mentioned recently, contains 5000 spinning spindles, 2500 twister spindles and complement for the production of cotton yarns 12s to 24s, daily capacity being 2500 pounds, and sixty-five operatives being employed. Production will be commenced about March 1.

The annual meeting of the Woodruff (S. C.) Cotton Mills was held during the week. The management reported that the delay in completing the installation of machinery has been caused by labor difficulties in Northern foundries, and now the machinery having been shipped, it has gone astray en route. This plant is to have 10,000 spindles and 300 looms, operating by steam-power.

The Shawnee (O. T.) Electric Light & Power Co. contemplates the erection of a cotton factory to have equipment of from 3000 to 5000 spindles and to be operated by electrical power. The company is desirous of ascertaining whether it is best to connect motors direct to the machines or drive the machines from line shaft, and solicits correspondence from electrical installation companies.

Jacksonville (Fla.) Knitting Co. has completed its new knitting plant, built to replace the mill burned last July. A building three stories high, 60x100 feet in dimension, has been erected, and in it have been installed twenty-eight machines. About fifty operatives are now employed, and this number will be increased gradually. Knit undergarments is the product. The investment is $30,000.

Premier Hosiery Mills of St. Louis, Mo., reported incorporated with $15,000 capital last week, absorbs and will continue the plant of W. G. Hills, formerly conducted under the same title. Paul F. Vogel is president and general manager; Frank Hamilton, vice-president, and John Oltmanns, secretary-treasurer. Fifty machines are operated, and the product is fine-gauge cotton hosiery. The company buys its yarns and both dyes and finishes its product. Steam and electric power are used.

The projectors of the cotton-mill company at Tallapoosa, Ga., have been visiting operating cotton factories during the past week in the pursuit of complete information regarding such an industry. The subscription list is meeting with favor among the business men, and it is confidently expected that a 5000-spindle plant will be secured. Tallapoosa Cotton Mill Co. is the name proposed, and $100,000 the capital desired to invest. Messrs. J. C. Tumlin, J. T. Tuggle and W. J. McCurdy are pushing the enterprise.

QUOTATIONS OF COTTON YARNS.

By Buckingham & Paulson, New York, Philadelphia and Chicago, February 18.

No. 10s-1 and 12s-1 warps	13⅝@14
No. 14s-1 warps	14½@—
No. 16s-1 warps	14⅝@15
No. 20s-1 warps	15 @15½
No. 22s-1 warps	15½@—
No. 26s-1 warps	15⅝@16
No. 6s to 10s bunch yarn	13 @13½
No. 12s-1	13½@13¾
No. 14s-1	14 @—
No. 16s-1	14 @14½
No. 20s-1	15 @15½
No. 22s-1	15½@—
No. 26s-1	15⅝@16
No. 8s-2 ply soft yarn	13½@13¾
No. 10s-2 ply soft yarn	14 @14½
No. 8s-2 ply hard	13½@—
No. 10s-2 ply hard	13½@13¾
No. 12s-2 ply hard	14 @—
No. 14s-2 ply	14 @—
No. 16s-2 ply	15 @—
No. 20s-2 ply	15½@—
No. 24s-2 ply	16½@—
No. 26s-2 ply	16½@—
No. 30s-2 ply yarn	17½@—
No. 40s-2 ply	22 @—
No. 8s-3, 4 and 5 ply	13½@—
No. 20s-2 ply chain warps	15½@15¾
No. 24s-2 ply chain warps	16½@—
No. 26s-2 ply chain warps	17 @—
No. 30s-2 ply chain warps	17½@18
No. 16s-3 ply hard twist	15 @—
No. 20s-3 ply hard twist	15½@—
No. 26s-3 ply hard twist	16½@—

Market firm; fair demand.

Cottonseed-Oil Notes.

The Canton Oil Mill Co. of Canton, Miss., has increased its capital stock from $30,000 to $50,000 in order to double the capacity of its plant.

It is reported that Homer, Miss., is soon to have a cottonseed-oil mill, the enterprise being well under way. About $30,000 has been subscribed, and the full stock is likely to be taken in a few weeks.

The market for cottonseed products last week at Dallas, Texas, was quiet at 33 cents for prime crude oil, prompt shipments. Prime summer yellow was offered at 36 cents, with no sales. Meal and cake were strong at $24 to $24.75 f. o. b. Galveston. Linters were unchanged.

A fire in the grist-mill department of the International Cottonseed Oil Mill at Selma, Ala., last week destroyed the elevator stored with corn valued at $40,000 and $10,000 worth of cottonseed meal and cottonseed. The ginnery of the plant was also badly damaged. The Messrs. L. and E. Lamar, who are the principal owners of this plant, figure their loss at $70,000.

The Houston Post gives the following quotations for cottonseed products: Prime crude oil, loose, 33 cents; prime summer yellow oil, 36 cents f. o. b. mills at interior points; linters, 2 to 2½ cents; hulls, loose, $8 per ton; prime cottonseed meal, $24.50, and cottonseed cake, $24 f. o. b. Galveston.

The following are the official quotations on cottonseed and cottonseed products as posted at the Cotton Exchange in New Orleans on the 17th inst: Prime refined oil in barrels, 40½ cents per gallon; off refined oil in barrels, 39½ cents per gallon; prime crude oil, loose, 34½ cents per gallon; off do., nominal per gallon; prime cottonseed cake, $26.12½ per ton of 2240 pounds; off do., nominal; prime cottonseed meal, $26.25 per ton of 2240 pounds; off do., nominal; soap stock, loose, 1.25 cents per pound; linters per pound, choice, nominal; A, 3¼ cents; B, 3 cents; C, 2¾ cents; cottonseed in sacks delivered in New Orleans, $16 per ton of 2000 pounds; in bulk delivered in New Orleans, $15 per ton of 2000 pounds.

James River Power.

The power of the James river near Warren, Va., will be developed for transmission to manufacturing industries by Messrs. Lane Bros. & Co., who will erect a $200,000 electrical plant. Riparian rights have been purchased, and engineers have been engaged to make the necessary surveys, estimates, etc. It is said that soapstone works at Warren, cobble and slate works at Esmont and slate works at Arnonia have already contracted to use a portion of the power when it is ready for distribution. A race is now being constructed, and work on the dam is expected to begin soon. David H. Pitts is representing the firm at Richmond.

American Trade with Mexico.

The British consul at the City of Mexico has been making an investigation of the increase in trade between the United States and that country, and finds that American competition has greatly decreased British exports, although fifty years ago English merchants furnished the bulk of the articles imported. The consul believes that the British manufacturer and merchant must adopt more modern methods and show more enterprise if they expect to even hold their own in the republic, and refers to the enterprise of Southwestern firms in advertising their wares in the principal Mexican cities both in Spanish and English. American agencies are also being established in the capital and other large communities, in order that the exporters may have representatives continually in the field to promote trade.

Pinchbeck Bros. of 71 Queen street, London, write to the Manufacturers' Record that they have been converted to the idea of selling American hardware, for which there is a good opening in England. They mention particularly farming tools, spades and shovels, domestic implements, wire nails, horseshoe nails, bird cages, bolts and nuts and galvanized wire netting.

The Norfolk Chamber of Commerce has been organized, with Messrs. Wyndham R. Mayo, president; F. S. Royster and Charles W. Priddy, vice-presidents, and Caldwell Hardy, treasurer.

Business men of the large cities in the Mississippi valley are working hard for a large appropriation to secure persistent work for the improvement of the Mississippi river.

LUMBER.

[A complete record of new mills and building operations in the South will be found in the Construction Department.]

LUMBER MARKET REVIEWS.

Baltimore.

Office Manufacturers' Record,
Baltimore, Md., February 19.

The local lumber market continues to show a very steady tone to values in the various avenues of the industry. Receipts so far during the month have been light, owing to the severe weather prevailing and the obstacles vessels meet with in the bay trade. Handling lumber in this weather is also difficult, and consequently the volume of business under all conditions is moderate. The demand for North Carolina pine continues brisk, and stocks are now somewhat broken, and it is difficult at times to fill orders. Prices throughout the list are well maintained, and under the present demand show a further tendency to advance. Box lumber is in fair demand, boxmakers buying freely. It is stated that the boxmakers of this city are about to combine into one organization, but plans, it is said, are not yet matured. The market for white pine shows considerable strength, and prices are firm, with holders asking outside figures. In hardwoods there is a very steady market, with a good demand for dry lumber. Oak, ash, walnut, poplar and other woods show considerable firmness, and there is a good demand from out-of-town manufacturers. The foreign export market is still unsettled, with shipments light.

Norfolk.

[From our own Correspondent.]
Norfolk, Va., February 17.

Notwithstanding the storm wave which has swept over the North Carolina pine belt during the past week, the movement in all departments of the lumber industry continues to show a remarkable volume of business under present conditions. There never was a period in the history of the North Carolina pine trade when business was on a more solid basis. The reports received by prominent companies here show that the small mills are all rushed with orders, a number of them having sold their output of lumber for the present year, while prominent companies with headquarters in Norfolk and other points in Virginia and Eastern Carolina are enjoying a first-class demand. The question of prices is lightly dwelt upon by buyers, who are anxious to get lumber, and freely pay list figures for prompt or near delivery. The demand is not confined to any particular grade of lumber, but extends throughout the list. Stocks, however, continue light and by no means ample for the present inquiry, which is taxing the mills to an extraordinary degree. The movement in hardwoods is moderate, but withal there is a steady demand and prices firm. The inquiry from woodworking concerns has been better this month than last, and prospects for a better volume of trade during the present month are more encouraging. Receipts are moderate, and stocks of dry hardwood lumber continue light owing to the severe weather in the interior, which interferes with logging operations here. Planing mills here are all very busy, as well as box factories and woodworking factories.

Savannah.

[From our own Correspondent.]
Savannah, Ga., February 17.

The outlook for a good, average volume of business during the present year in all lines of the lumber industry is at present

very encouraging. The conditions surrounding the market are very favorable, and the demand from Northern and Eastern points, as well as business with interior towns, is at the moment showing material improvement. The shipments of lumber continue to improve, and with favorable weather vessels now overdue would arrive in port to load for coastwise points. The shipments last week were not unusual in quantity, about 3,000,000 feet going out. Prices throughout the list continue firm, and crossties, for which the demand is brisk, are quoted at $11.50 per M for sawn ties, and hewn ties 7x9x8½ are firm at 38 cents each; minimum easy-sized yard stock, $14.50 to $15; car sills, $15 to $15.50, and ship stock, $23. At Brunswick everything in the lumber line is in good shape, and both the domestic and foreign business is very brisk. At present the crosstie industry is better than for some time past, and during the present month shipments are expected to be larger than those of January. The foreign trade continues to improve, and at the moment is showing up in excellent form. The freight business is of light proportions, and vessels are in moderate offering, and not urged at any concessions in rates. Rates to New York are steady at $5 to $5.25, and Boston $5.50 for lumber and 14 cents for crossties. Rates to Brazil $14.50.

Mobile.

[From our own Correspondent.]

Mobile, Ala., February 17.

The week under review has shown a much better volume of business than that of a week ago, and in lumber especially the shipments have been unusually heavy. There is a good demand at the moment from South American and Cuban ports, and some large contracts have been closed for early shipments to those sections. The total shipments of lumber last week aggregated nearly 5,000,000 feet, the bulk of which went to Cuba and South America. The inquiry from European ports is fair, and nearly every foreign vessel clearing takes part cargo of lumber. The shipments of lumber so far this season aggregates 41,492,815 feet, against 46,134,227 feet last year. Mills in the Mobile section complain of a scarcity of logs, and many of them are obliged to saw on half-time. At adjacent milling sections in Alabama, Florida and Mississippi there is an unusual movement, and both export and coastwise business is of considerable volume. The timber market continues to show a very firm tone, and sales are reported at 15 to 15½ cents, with holders not disposed to make concessions in order to do business. Stocks of timber are very light, but owing to the recent rise in rivers, have increased 20,000 pieces during the past week. The freight market continues steady, and the offring of vessels moderate. The following charters are reported: German steamer Franz Horn, 969 tons, from the Gulf to Sutton Bridge with timber at 91/3, March-April; Russian bark Alku, 798 tons, from Mobile to United Kingdom or Continent with timber at 95/, and German steamer Martha Russ, 1261 tons, from Ship Island to Holland with timber at 85/, March-April.

Nashville.

[From our own Correspondent.]

Nashville, Tenn., February 17.

The extreme cold weather prevailing in this section has materially restricted business in many lines of the lumber trade. The big tide in the Cumberland river and in all the upper streams has brought out considerable lumber, probably about 4,500,000 feet. Operations in rafting logs have been retarded by very cold weather, and under more favorable weather conditions a much larger quantity of timber would have been received. The demand at present for hardwoods is fairly active, and orders on the books are accumulating, and will continue to do so until milder weather prevails. Poplar is most prominent among all commercial woods on this market, and is in brisk demand, with prices firm and hardening. Stocks are by no means excessive, and the output for the present year, it is stated, will be about one-half that of last year. Quartered white oak is firm, with stocks moderate and prices about 10 per cent. higher than in January. White thick plain dry stock is in good demand at the recent advance in prices. Ash is in demand, and prices very strong, with stocks light. Car companies, railroads, wagon shops and all woodworking concerns are buying stock very freely. There is a fair export business, but the market is very quiet, and the movement is about one-third heavier than last year. Lumbermen here are investing in timber lands whenever a desirable lot is offered, and during the past fortnight several prominent lumber firms have been buying. It is stated that John B. Ransom & Co. of this city have purchased the timber rights on two large tracts, one at West Point, Tenn., containing about 6,000,000 feet of poplar, and another at Betton, Ky., containing about 7,000,000 feet. Mr. Samuel Ransom of the Nashville Lumber Co. has purchased from Kyle & Hatcher of Celina about 5,000,000 feet of logs, and 175,000 feet from C. L. Kyle. The movement in poplar in this market during the present year is likely to assume greater proportions than usual, and from all indications values will continue firm, with a hardening tendency. Other hardwoods are all very steady in price.

Lumber Notes.

The El Paso Sash & Door Co. of El Paso, Texas, has been incorporated, with a capital stock of $30,000. The incorporators are J. B. Burton, J. A. Shedd and J. H. Russell.

The schooner Nellie W. Howlett cleared from Wilmington, N. C., last week for New York with 558,000 feet of kiln-dried lumber. The cargo was shipped by the Cape Fear Lumber Co.

At Imboden, Ark., there are at present more crossties in the yards than at any time in the history of the town. There are now ready for shipment over 50,000 ties and 50,000 cedar posts, with liberal weekly receipts.

The Mount Lumber Co. of Carter county, Tennessee, was chartered last week, with a capital stock of $30,000. The incorporators are John W. Tipton, Lee F. Miller, James D. Jenkins, John H. Tipton and W. P. Dugan.

The Apalachia Tannic Acid Co., formerly located at Wheeling, W. Va., and engaged in the manufacture of oak and hemlock bark and chestnut wood extracts for tanning, has established its offices and factory at Apalachia, N. C.

The Swann-Day Lumber Co. of Clay City, Powell county, Kentucky, has been incorporated, with a capital stock of $200,000. The stockholders are James Swann of New York, Floyd Day of Jackson and Edward S. Jouett of Winchester.

The American schooner Sallie J. arrived last week at Gulfport, Miss., to load 500,000 feet of lumber for New York. On the 12th there were four vessels loading at Gulfport, all carrying larger cargoes than the schooner above mentioned.

It is stated that W. K. Merrick of Dillsboro, Ark., a wealthy lumberman, is now surveying the field at and in the vicinity of Memphis for the purpose of erecting an extensive lumber plant. He will probably open negotiations at once for the purchase of a site.

The Pine Valley Lumber Co. of Texarkana, Ark., has been incorporated, with a capital stock of $25,000, of which $5000 is subscribed. The incorporators are G. W. Fouke, president; Hugh Corry, vice-president; W. L. Hayden, treasurer; W. B. Switzer, secretary, and Arthur Corry.

It is stated that the Lumbermen's Association of the South will erect on the grounds of the St. Louis Exposition a $50,000 clubhouse, which will serve the double purpose of advertising cypress and yellow pine and of furnishing a meeting-place for Southern lumbermen during the great show.

Mr. John H. Kirby of Houston has purchased for his private account the pine-timber holdings of the Nona Milling Co. of Beaumont, Texas. The price paid was $250,000. For the Kirby Lumber Co. a tract of 43,000 acres of pine lands at Devers, Texas, has been purchased, terms of which are private.

The shipments of lumber last week from Mobile, Ala., aggregated over 5,000,000 feet, about 2,500,000 feet going to South American ports, 500,000 feet to Cuba and the balance to the United Kingdom and Continent. The sawn timber shipped during the week aggregated 291,990 feet, and hewn timber 7383 cubic feet.

The Lockwood Manufacturing Co. at Birmingham, Ala., has begun work under its new management. The output of the company is packing boxes and veneering generally. The wood to be used will be nearly all secured from the forests in Jefferson county, where there is an abundance of gum, tupelo, hickory and other valuable woods.

The outlook for the spoke and handle company recently incorporated at Burlington, N. C., is said to be very promising. Work on the plant will shortly be commenced and pushed to completion. The following are the officers of the company: George W. Anthony, president; J. W. Murray, vice-president; Alexander C. Holt, secretary and treasurer.

A new veneering company was organized last week at High Point, N. C., to be known as the High Point Veneering Co., and will manufacture veneers and excelsior. The following officers were elected: J. O. Clinard, president; M. J. Wrenn, vice-president, and J. W. Clinard, secretary and treasurer. The location of the plant is under consideration.

During the past year over 2,000,000 staves were exported from Galveston, Texas, to European ports. The majority of them are being shipped from the Trinity river bottom by the Tillers Stave Co. They have heretofore been received at Galveston by rail, but the company now proposes to ship them to Galveston by barges, four of which are now being built.

Messrs. C. G. Watson and F. J. Wooding, operating under the firm name of Watson & Wooding, have purchased the saw-mill originally owned by C. W. Watson, located near Chatham, Va., but recently moved near Whittles Station. The mill has been fitted with improved machinery, together with a dresser, edger and equalizer, and will have a capacity of 15,000 feet of lumber a day.

The schooner Pasadena cleared last week from Charleston, S. C., for New York with 468,000 feet of lumber, and the schooner Jeremiah Smith for the same port with 333,000 feet. The steamer Algonquin took out 28,000 feet of lumber for Boston. The total shipments from Charleston since September 1, 1901, aggregate 26,752,105 feet, against 27,266,506 feet for the corresponding period in 1900-1901.

The members of the forestry bureau who have been making a preliminary survey of the holdings of the Kirby Lumber Co. of Houston, Texas, have finished their work for the present and left Houston last week for Washington. The commission was satisfied with its inspection and survey of the forests, and with the opportunities for practical forestry offered by the holdings of the Kirby Lumber Co.

Mr. James Mechan, a prominent Milwaukee lumberman, has purchased 15,000 acres of pine timber land in the Southeastern timber belt. The land is located in central Mississippi, at the edge of the short-leaf pine belt. Mr. Mechan will at once purchase machinery for a mill which he will erect on the land and the plant pushed to completion. The mill will have a daily capacity of 60,000 or 70,000 feet of lumber, provided with band and gang saws.

It is stated that the property of the Caldwell Land & Lumber Co. of Lenoir, N. C., has changed hands, having been purchased by Mr. George Shakespeare, trustee, representing, it is said, Philadelphia capitalists. The consideration named was $517,517. This property consists of a large mill near Lenoir, about 4000 acres of timber lands and the Caldwell & Northern Railway, which runs eleven miles northwest of Lenoir to Colletsville.

At a meeting of the American Woodstock Association last week at Cincinnati, Ohio, it was decided that the short supply of oak and hickory, the woods mostly used in the members' plants, demanded an immediate and marked increase in the price of finished product. After much discussion, an increase of 15 per cent. was decided upon. The reports indicated that the present stocks were from 25 to 60 per cent. short of what they were a year ago.

Among the clearances last week from Jacksonville, Fla., were the following vessels: Steamers of the Clyde Line, consisting of the Arapahoe, with 300,000 feet of lumber and 5000 bundles of shingles; the Iroquois, with 375,000 feet of lumber and 6000 bundles of shingles, and the Comanche, with 400,000 feet of lumber and 3200 crossties among their cargoes. The schooner Edward G. Hight cleared for Baltimore with 333,000 feet of lumber, the schooner John H. Jackson for New York with 420,000 feet of lumber, and the schooner Austin D. Knight for New York with 320,000 feet of lumber.

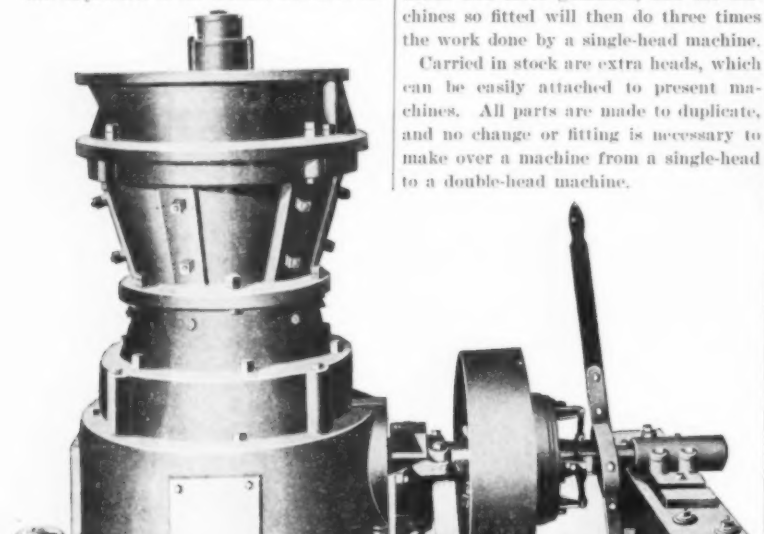
The regular meeting of the Southern Cypress Shingle Association was held last week in New Orleans. This association comprises all the leading manufacturers of Louisiana, Texas and Arkansas. The question of stocks was taken up, and the discussion developed that they were unusually light, none of the mills having anything like the usual stock on hand. Under these conditions, and with the heavy demand existing, it was determined to advance the price of five and six-inch best and six-inch prime ten cents per thousand. The other list prices remain unchanged, the list now reading: Five and six-inch bests, $3.60; four-inch bests, $3.40; five and six-inch primes, $3.10; four-inch primes, $2.90; extra A Star, $2.40; five and six-inch Economy, $2.25; standard A Star, $2; random clippers, $1.40. The meeting adjourned to meet in Houston on April 8 next.

The Merchants' Association of Augusta, Ga., has changed its name to the Chamber of Commerce of Augusta, with Mr. E. B. Hook, president.

MECHANICAL.

Rotary Fine Crusher.

Crushers are claimed to do the work at one-fifth the cost of the best grinders or pulverizers, and experience is said to amply confirm this. It is therefore of much importance to reduce materials as fine as possible in the crusher and save the wear and tear of machines working at a much greater cost.



THE STURTEVANT ROTARY FINE CRUSHER.

The Sturtevant Mill Co. of Boston has long seen the importance of doing as much work as possible in the breakers, and has made a special study of these fine reduction machines. Its well-known roll-jaw crushers reduce all hard materials at once without screens to one-quarter inch, and its rotary crushers handle all rocks of moderate hardness, such as limestones, lime, gypsum, phosphate, talc, coal, etc.; in fact, nearly any substance below quartz in hardness, easily reducing them to the size of wheat. This is extraordinary work, large blocks quickly breaking to these small sizes without screens, and leaving an output in the best possible condition for economical reduction in mills and pulverizers.

Rotary crushers are comparatively inexpensive. They have large capacity, easily crushing from 8 to 12-inch pieces at the rate of from six to fifteen tons per hour. The Sturtevant rotary fine crushers, one of which is illustrated herewith, are intended to supply rock emery grinding mills and every kind of pulverizer with material upon which they can do their best work. Whatever machine is used for finishing, fine crushing is of capital importance, and absolutely essential if good economy is to be attained.

There is no better investment for any plant than a fine rock crusher. Whatever work it will do is done with unexampled economy. A roll-jaw crusher for hard rock reduces to one-quarter inch and finer, and a Sturtevant rotary crusher breaks down all rocks of moderate hardness to wheat sizes. Hundreds of users have found these to be paying investments.

They are massive, efficient and durable, need no foundation, operating easily on any strong mill floor.

Full particulars may be had from the manufacturer.

Carver Linter and Gin-Saw Filing Machine.

The machine herewith illustrated is fitted with double head and two gummers, and has been built to meet the demand of those oil mills where the Carver single-head filer and gummer is not able to do all the necessary filing of cylinders.

It will file and gum a cylinder in one-half the time required by a single-head machine.

Where still more work is desired of these machines, they are fitted with three heads and three gummers, and the machines so fitted will then do three times the work done by a single-head machine.

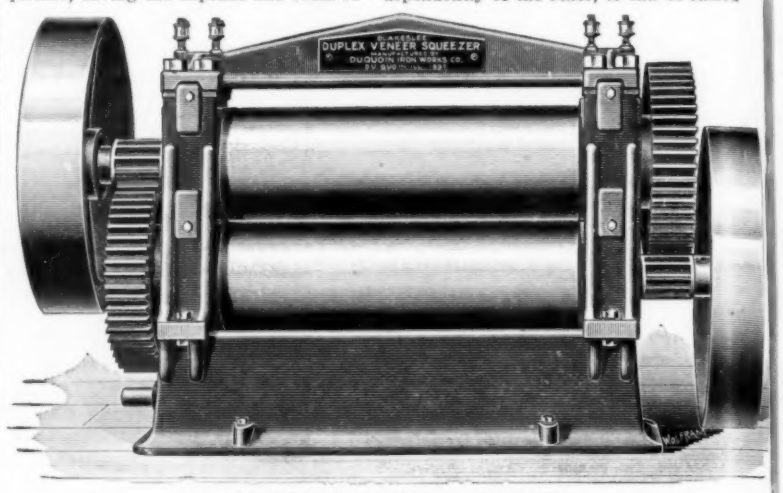
Carried in stock are extra heads, which can be easily attached to present machines. All parts are made to duplicate, and no change or fitting is necessary to make over a machine from a single-head to a double-head machine.

The builder is the Carver Cotton Gin Co., East Bridgewater, Mass.

The "Blakeslee" Duplex Squeezer.

During recent years there have been great advances made in the way of cutting much thicker veneer than was formerly considered practicable. This has developed a necessity for improved methods of properly taking care of it, the most important of which is the elimination of the moisture, so as to preserve the material in the best possible condition and consume the lease possible time. This has resulted in the introduction of a special machine for taking out as much of the water as possible mechanically, leaving the veneer somewhat more flexible, and less to be done by either air or kiln drying.

The advantages are that material can be put into marketable condition much quicker, saving the expense and room required by slower processes, also improving the product.

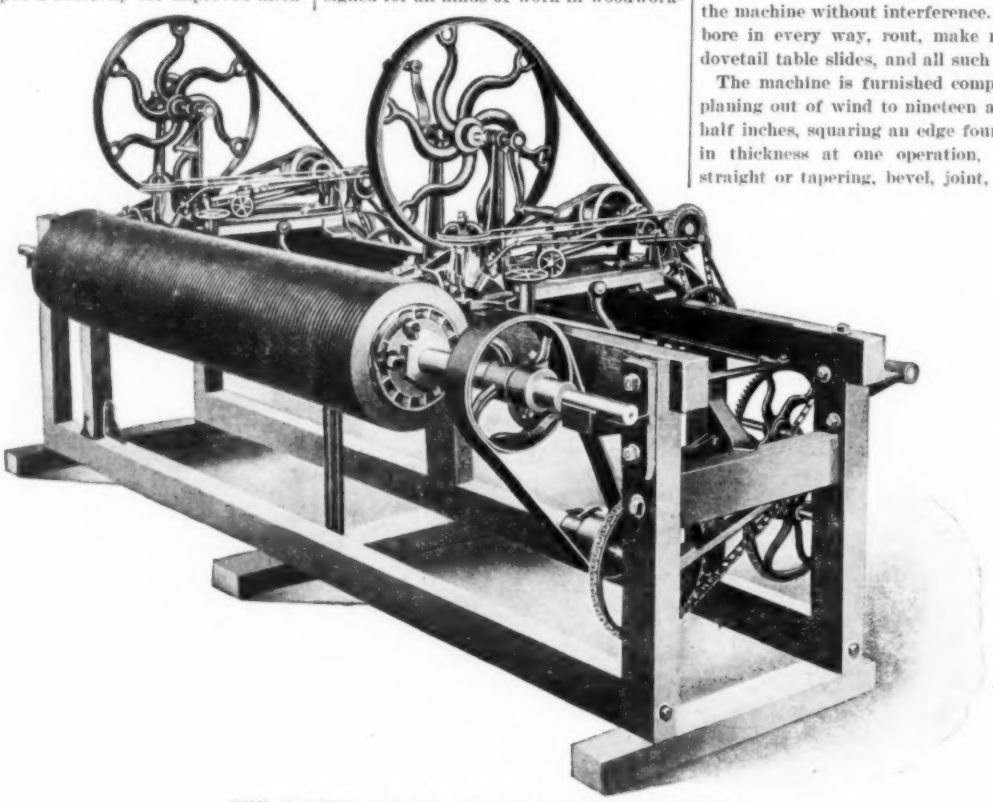


THE "BLAKESLEE" DUPLEX SQUEEZER.

The machine referred to is illustrated herewith. Its general features are readily seen, but the special unique feature is the double drive, which gives it the name of "Duplex." The necessary power for operating it is considerable, and therefore it is important that it be done in the best mechanical manner, and dividing the power and applying it in equal amounts at each end of the machine, leaves nothing to be desired. There are a number of other good features worth investigating, and a card of inquiry addressed to the maker, the Blakeslee Manufacturing Co., Birmingham, Ala., will bring full particulars.

New Heavy Universal Woodworker.

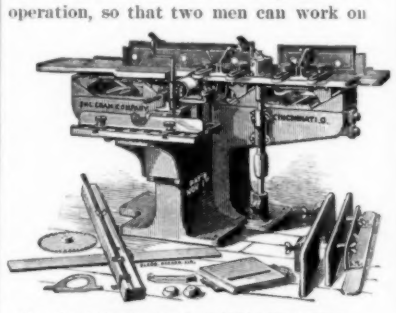
The machine illustrated herewith is designed for all kinds of work in woodworking establishments. The maker has made a specialty of building machines of this character, and on account of their many advantages and conveniences they have met with unqualified favor.



THE CARVER LINTER AND GIN-SAW FILING MACHINE.

This woodworker will work to nineteen and one-half inches wide, will take out of twist large timbers, and planes perfectly true a right angle at one operation. The tables are wide and long, have wide grooves for gaining and paneling frames, and each can be raised and lowered independently of the other, or can be raised and lowered on a circle of the head or straight up and down.

All these adjustments are made on the working side of the machine close to the cutters, a feature readily appreciated. The boring attachment is independent in operation, so that two men can work on the machine without interference. It will bore in every way, rout, make rosettes, dovetail table slides, and all such work.



No. 2½ UNIVERSAL WOODWORKER.

The machine is furnished complete for planing out of wind to nineteen and one-half inches, squaring an edge four inches in thickness at one operation, surface straight or tapering, bevel, joint, rabbet, make concave or convex glue joints, mold straight, circular or waving, chamfer, rout, bore, gain, groove, raise panels, rip, cross-cut, cut rosettes, and, in fact, perform work that is remarkable for variety, style and quality.

The maker, J. A. Fay & Egan Com-

pany of No. 270 to 290 West Front street, Cincinnati, will send further particulars.

Badger Oil Cup.

Messrs. Charles H. Besly & Co., 10-12 North Canal street, Chicago, are selling many thousands of the Badger oil cup illustrated herewith. This cup is to be used with Helmet oil, and is one of the best cups made for general machinery having hard usage.

FIG. 1—THE BADGER OIL CUP.

It has octagonal cap, and can be operated by hand or wrench. The base of cup has round thread with hexagon steel stem threaded screwed into base and expanded. This steel stem will not break off. Cup has round thread both in cap and on base, as shown in sectional view. The thread will not strip, cross or clog.

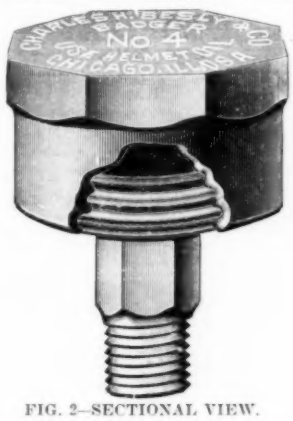


FIG. 2—SECTIONAL VIEW.

Used with Helmet oil the cup will lubricate anything. It will not leak or break. It is made in six sizes, ranging from one and one-quarter inches outside diameter to three and five-eighths inches outside diameter, with pipe thread from one-quarter inch to one-half inch. It can be obtained upon application, together with prices and full descriptive matter.

Views of an English Firm.

In a letter to the Manufacturers' Record Coutts, Muir & Co. of Glasgow, Scotland, who desire to represent American firms there, write that the United States has supplied engines for the power station of the city's tramway system and cast-iron pipes for the water department, besides machine tools, fans, valves, ironmongery, etc. They add: "We are not of the opinion that Britain is a played-out country. We are hopeful that the inrush of American goods will open the eyes of our manufacturers and lead them to adopt the latest methods in turning out their various products in competition with America. Our people are handicapped to a large extent by trade-unionism. A significant fact in America is the formation of large trusts or combines. These will slowly be followed by workers' combines, and then commercial war will begin. In the meantime, there are many articles of American manufacture which will also command a market here, and our aim is to get hold of such."

PHOSPHATES.

Phosphate Markets.

Office Manufacturers' Record,
Baltimore, Md., February 19.

The local phosphate market is very steady, in sympathy with the firmness in other fertilizer ingredients. Brokers report sales of Tennessee rock showing a fairly steady market. Fertilizer men are not in the market for any large deals, but seem to purchase for immediate wants. The following charters were reported for the week: Schooner J. W. Elwell, 1081 tons, from Port Tampa to Baltimore with phosphate on private terms; schooner Major Pickands, 873 tons, from Port Tampa to Baltimore or New York with phosphate rock on private terms, and steamship St. Hubert, 1962 tons, from west coast of South America to New York with nitrate at 22/6. The market generally at all Southern mining points continues to show improvement, a steadier tone ruling throughout the phosphate belt. Mining in South Carolina is active, and the output gauged to meet shippers' wants. Prices f. o. b. Ashley river are steady. In Florida prominent companies consider the situation satisfactory, and the market is firm for both land rock and pebble. The foreign inquiry is improving, and Florida rock abroad is a strong competitor in the market with Algiers and the French field. The Phosphate of Paris, France, considered a standard authority, in its issue of February 5 reviews the phosphate market as follows: "We consider it useless to again refer to the phosphate market of La Somme. Concerning chalks, the situation remains unchanged, and there is reason to believe that the 'statu quo' is fixed for some time, since certain sellers of chalks have already arranged among themselves the selling prices for coming years by obligating themselves for a term extending from 1903 to 1905 at the market prices of the day. From this we are confronted with a settled situation established for some months, and against which it is perhaps difficult to resist. But really sellers of high-grade phosphates of La Somme would certainly find it very embarrassing to give plausible reasons which have influenced them and led them to concede a new depreciation to the course of their market. We have sought and caused to be sought the causes of this weakness, but no one has given us the key to the mystery; middlemen themselves are absolutely astonished at the concessions which are daily produced. It is impossible to cite direct competition, as the number of operators is too restricted actually, and among those who remain many will close their factories in a little while, irrespective of the consequence of the losses which recent values will entail." The Tennessee market continues steady at last week's quotations. Mining operations have been retarded by the severe weather, but preparations are making by prominent companies to extend operations on the advent of spring. There is a good inquiry for both domestic and foreign rock.

Fertilizer Ingredients.

There is a better tone to the market for ammoniates, and prices are firm and higher for both blood and tankage. It has been reported for some time past by producers that stocks were light, and the sudden advance in the market shows that the situation in the West has not been overdrawn. The offerings are light, while the demand from the South and West is good.

The following table represents the prices current at this date:

Sulphate of ammonia (gas)	$2 20	@	2 25
Nitrate of soda, spot Balto	2 10	@	2 20
Blood	2 30	@	2 32½
Azotine (beef)	2 30	@	—
Azotine (pork)	2 30	@	—
Tankage (concentrated)	2 17½	@	2 20
Tankage (9 and 20)	2 27½	@	2 32½
Tankage (7 and 30)	21 00	@	22 00
Fish (dry)	27 50	@	30 00

Phosphate and Fertilizer Notes.

The board of directors of the Virginia-Carolina Chemical Co. has declared a dividend of 1 per cent. on the common stock of the company, payable March 1, 1902.

The Gulf Transit Co. of Pensacola cleared the steamship Deptford last week from that port for Bordeaux with 2750 tons of Tennessee phosphate rock and other cargo.

The fertilizer factory owned and operated by E. S. Truitt at Salisbury, Md., was completely destroyed by fire last week. The loss is estimated at $4000; insurance unknown.

The Hills Cymene & Chemical Co. of Hot Springs, Ark., has been incorporated, with capital stock of $150,000. The incorporators are J. W. Westmoreland, president; B. W. Breedlove, C. H. Hoover, E. E. Hill, L. F. Shorley and R. A. Shorley.

It is reported that the Scott Fertilizer Co. of Elkton, Md., has closed a contract with a mining company in Florida for phosphate rock for five years. The Scott Company has recently enlarged its works, and also erected a modern up-to-date acid plant.

The steamship Quarnero cleared from Savannah, Ga., last week for Bremen and Hamburg with 1861 tons of high-grade Florida phosphate rock among her cargo for the latter port. The steamship Moro cleared for the same destination with 1100 tons among her cargo.

The phosphate shipments from the port of Savannah, Ga., for the month of January, as reported by J. M. Lang & Co., were as follows: Steamer Cynthia for Bremen with 402 tons; steamer Cyclades for Genoa with 2012 tons, and steamer Alba for Bremen with 1380 tons, a total of 3794 tons.

A portion of the Standard Guano & Chemical Fertilizer Co.'s plant at New Orleans was destroyed by fire last week. The three-story warehouse, grease factory, the warehouse of the oil works and office building were totally destroyed. The loss is estimated at over $70,000, and may run higher. The property was fully covered by insurance.

It is stated that many of the large phosphate companies and contractors in the Mount Pleasant and other sections of the Tennessee phosphate belt are making arrangements to begin active mining operations as soon as the weather opens up. The spring season with favorable weather, bids fair to be one of unusual activity in mining and shipping.

It is stated that the old Cape Fear & Yadkin Valley terminal across the river on Point Peter at Wilmington, N. C., has been leased from the Atlantic Coast Line by the Armour Company of Chicago. The property will be used as a warehouse and mixing plant for fertilizers. It has been also stated that the Armour Company is contemplating the erection of a fertilizer factory at that point.

Representatives of the Philadelphia Trades League will visit a number of the seaport and Gulf cities of the South with a view to strengthening steamboat connections between them and Philadelphia.

During the seven months ended January 31 the exports through Galveston were valued at $72,058,596, an increase over the same period last season of more than $1,300,000.

Literary Notes.

On Saturday, February 15, the Electrical Review of New York published a number commemorating the twentieth anniversary of its foundation. In the twenty years represented by the life of this journal all of the great applications of electricity with which the public is now familiar have arisen and been developed, with the sole exception of the telegraph and the telephone. In 1882 the latter was only beginning to be appreciated as an aid to business and as a legitimate means of carrying on correspondence. Some of the figures given are exceedingly interesting. The telegraph has doubled in its extent and importance since 1882, and now enlists an investment of more than half a billion dollars. The telephone has grown until more than two million telephones are connected to exchanges. The electric railway is only fifteen years old, yet the money spent in building the electric railroads in the United States has already aggregated a sum equal to the cost of the Civil War, while the number of passengers transported by trolley cars in this country alone every month is greater than the population of China. Electric lighting had its beginning on a commercial scale in the opening of Mr. Edison's power station in Pearl street, New York, September 4, 1882, and now the electric light is to be found in every part of the world. Among the subjects discussed in this interesting number are historical and reminiscent articles by the various men who have done so much to make American electrical engineering famous.

The February number of the Southern Workman, published by the Hampton Institute Press, contains a number of strong Indian articles. Dr. Merrill E. Gates contributes an appreciative paper on the life and work of the late Bishop Whipple, which is accompanied by an excellent portrait. Practical suggestions are given for the solution of "Indian Industrial Problems" by Mrs. F. N. Doubleday, whose helpful interest in reviving the Indians' native arts is well known. The wild-rice industry is advocated for Indians in a valuable scientific article by Albert Ernest Jenks of the bureau of ethnology, while a capital story by William Justin Harsha makes clear the difficulties which beset Indian students on their return to the reservations.

Messrs. Garrett & Co. of Weldon, N. C., manufacturers of American wines, intend to establish a winery at Berkley, Va., with a view to removing their entire plant to that town eventually. It is the purpose to install about 200,000 gallons of cooperage, with the necessary machinery for crushing the grapes and distilling the refuse.

President Charles W. Dabney of the University of Tennessee is working for the establishment of a mining department in connection with that institution.

Martin Jacobson of Berlin writes to the Manufacturers' Record seeking information about American manufacturers of motors for propelling boats.

It is estimated that the Southern Car & Foundry Co. has contracted for about $6,000,000 worth of work represented in orders for 5675 cars.

Mr. J. L. Patton has been elected president, and Mr. F. J. King, secretary, of the Chamber of Commerce of Newport News, Va.

Joaquin Casaus of Zaragosa, Spain, desires to be put into communication with large American houses handling hides and skins.

CONSTRUCTION DEPARTMENT.

THE MANUFACTURERS' RECORD seeks to verify every item reported in its Construction Department by a full investigation and complete correspondence with everyone interested. But it is often impossible to do this before the item must be printed, or else lose its value as news. In such cases the statements are always made as "rumored" or "reported," and not as positive items of news. If our readers will note these points they will see the necessity of the discrimination, and they will avoid accepting as a certainty matters that we explicitly state are "reports" or "rumors" only. We are always glad to have our attention called to any errors that may occur.

*Means machinery, proposals or supplies are wanted, particulars of which will be found under head of "Machinery Wanted."

In correspondence relating to matters reported in this paper, it will be of advantage to all concerned if it is stated that the information was gained from the Manufacturers' Record.

It often occurs that the organization of a new company in a town is not known by the postmaster, and hence letters addressed to the company are returned marked "not known." The Manufacturers' Record reports the first organization of all companies, and our readers, in seeking to get into communication with them, should be very careful in deciding how to address them, and it is often advisable to add the names of one or more incorporators as an aid to the postmaster in delivering mail.

ALABAMA.

Anniston—Cotton-cordage Mill.—Robert Lucas and others are forming company to establish a mill for cordage, rope, batting, etc.

Anniston—Gold Mines.—G. B. Flint, who is developing gold mines in Randolph county, will, it is reported, soon erect a large plant.

Birmingham—Electric-light Plant.—County courthouse will be equipped with an electric-light plant; well will also be sunk and pumping station built to secure water supply. Both the courthouse and jail will be supplied with light and water from these plants. Address "County Clerk."

Birmingham—Steam-heating System.—Birmingham Railway, Light & Power Co. is completing plans for the installation of system of steam or hot-water heating at a cost of $100,000 to supply buildings; installation will begin at the completion of the improvements now being made at company's powerhouse.

Birmingham—Coal Mines.—Turkey Creek Coal Co. has been incorporated, with capital stock of $50,000, by James A. Collins, G. A. Collins and James C. Moore.

Eufaula—Electric-light Plant.—City is considering proposition from the Eufaula Electric Light & Power Co. for lighting.

Henry Ellen—Coal Mines.—T. H. Moore Coal Co. has been incorporated, with capital stock of $10,000, by T. H. Moore and Fred G. Moore of Tuscaloosa, Ala., and J. W. Vandenbuerk of Vance, Ala., for development of coal mines at Henry Ellen.

Huntsville—Pants Factory.—J. E. Pierce is in correspondence with Kentucky parties relative to locating a pants factory at Huntsville.

Oxford—Electric-light Plant.—Anniston Gas & Electric Co., Anniston, Ala., has been granted franchise for establishing an electric-light plant at Oxford.

Selma—Cement Plant.—Company will be organized, with capital stock of $200,000, for the manufacture of cement, a large deposit of cement rock having been found on property of James F. Millhouse.

Wagar—Lumber Mills.—McClure & Grenamyer of Dyas, Ala., will take possession of the plant of Wagar Lumber Co. about March 1 and operate under the name of McClure Lumber Co.*

ARKANSAS.

Batesville—Drug Company.—Chartered: Casey Drug Co., with capital of $10,000, by R. C. Door, J. H. Kennedy, I. N. Barnett and others.

De Queen—Crate and Basket Factory.—D. C. Richardson will install machinery for manufacturing fruit boxes, grape baskets and wood bottle wrappers.

De Witt—Mineral Development.—Chartered: De Witt Land & Mineral Co., with capital of $10,000, by R. W. Hess, E. S. Jones, W. H. Allen, L. D. Winne and others.

Fayetteville—Mercantile.—Chartered: Evins Wilson Grocery Co., with capital stock of $30,000, by J. C. White, president, and others.

Hot Springs—Chemical Company.—Hill's Cymere & Chemical Co. has been incorporated, with capital stock of $30,000, by J. W. Westmoreland, B. W. Breedlove, C. H. Hoover and others.

Hot Springs—Tool, etc., Works.—International Patents Co. has organized, with capital of $10,000 and A. B. Belding, president; P. S. Bentz, vice-president, and Robert Sanborn, secretary, for the manufacture of patented articles invented by Mr. Sanborn, which include the Jaquith interchangeable tool handle and the automatic halter.

Junction City—Stave Mill.—Cornie Stave Co. has been incorporated, with capital stock of $50,000, by J. D. Proctor, president; Thos. Robertson, vice-president and general manager; W. V. Brown, secretary, and R. G. Brown, treasurer.

Little Rock—Foundry and Machine Shop.—Chartered: Thomas-Fordyce Manufacturing Co., with capital stock of $250,000, by A. D. Thomas, president; John R. Fordyce, vice-president; O. H. Thomas, secretary, and B. D. Schaad, treasurer. New company takes over the business formerly conducted by Thomas Manufacturing Co. and Little Rock Gin & Machine Co.

Little Rock—Street Paving.—City contemplates paving forty-nine blocks with asphaltum at a cost of $170,000. Address "The Mayor."

Mountain Home—Realty Company.—White River Realty Co. has been incorporated, with capital stock of $50,000, by W. V. Powell, J. C. South and T. W. Harris.

Pine Bluff—Ice Plants.—Arkansas & Texas Consolidated Ice & Coal Co. has increased capital stock from $150,000 to $500,000 for the establishment of additional plants in Texas and Louisiana.

Newport—Gas and Fuel Company.—Citizens' Gas & Fuel Co. has been incorporated, with capital of $2000, by Gustav Jones, Crawford West, B. B. Bond and J. M. Jones.

Texarkana—Lumber Company.—Pine Valley Lumber Co. has been incorporated, with capital of $25,000, by G. W. Foulke, president; Hugh Carry, L. W. Haydon and others.

FLORIDA.

Key West—Wharves, Warehouses, etc.—Key West Wharf & Coal Co. has been incorporated, with capital stock of $150,000, for construction of wharves, warehouses, etc.

Tallahassee—Publishing.—Southern School & Home Publishing Co. has been incorporated, with capital of $2500, by L. W. Buchholz, president; W. N. Sheats, vice-president, and J. T. Blanchard, secretary.

GEORGIA.

Atlanta—Drug Company.—Charles O. Tyner has reorganized his drug business and incorporated as the Charles O. Tyner Drug Co., with capital stock of $20,000.

Atlanta—Real Estate.—I. S. Mitchell Real Estate Co. has been incorporated, with capital stock of $25,000, and privilege of increasing to $50,000, by I. S. Mitchell, Mrs. Emma Mitchell, Frank Mitchell and others.

Conyers—Cotton Mill.—Milstead Manufacturing Co., previously reported to establish $200,000 cotton mill, will build for 10,000 spindles. A water-power will be developed to furnish the power. Hall Bros. of Atlanta made plans for the developments. A. J. Milstead is president, and F. D. Milstead, general manager.

Dahlonega—Gold Mines.—Wm. I. Rush and Chicago (Ill.) parties are investigating with a view to developing gold mines.

Gainesville—Lumber Mills.—John A. Smith Manufacturing Co., Jos. M. Bell and Edwin A. Smith have incorporated Queen City Planing Mill Co., with capital of $15,000, for the manufacture of lumber into finished products.

Gainesville—Furniture Factory.—Chattahoochee Furniture Co. of Flowery Branch, Ga., is investigating with a view to removing its plant to Gainesville and organizing new company to operate it.

Griffin—Ice Plant.—J. Eli Brewer is increasing capacity of his ice plant (as lately reported) from five to fifteen tons per day; contract awarded.

Macon—Pants, etc., Factory.—Standard Manufacturing Co., Moritz Klinger, president, Atlanta, Ga., has purchased the pants factory of Weeks Manufacturing Co.; will enlarge and operate same.

Stone Mountain—Grist Mill.—Stone Mountain Milling Co. will erect grist mill.*

Tallapoosa—Knitting Mill.—W. H. Kimball and W. C. Kimball will establish knitting mill; machinery ordered.

Valdosta—Saw-mill.—J. A. Dasher, Jr., W. J. Durant, W. F. Outlaw and T. H. McKey have incorporated Valdosta Saw-Mill & Manufacturing Co., with capital stock of $12,000, for conducting general saw-mill business.

KENTUCKY.

Barboursville—Street Paving and Waterworks.—City council has passed ordinance appropriating $20,000 for constructing waterworks and macadamizing streets. Address "The Mayor."

Belle Helene—Brick Works.—Reuss-Klos-Gondran, Limited, has been incorporated, as recently reported under Hohen Solms, La., which is the company's office, its works being located at Belle Helene.

Clay City—Lumber Company.—Swann-Day Lumber Co. has been incorporated, with capital stock of $300,000, by James Swann of New York, Floyd Day of Jackson, and Edward Jouett of Winchester.

Halsey—Coal Mines.—Buck Creek Coal Co. has been organized, with capital stock of $600,000, for development of 8600 acres of coal lands in Whitley county. Promoters include Lutellus Smith of Chicago, president; T. Lyon White of Jellico, Tenn., vice-president; James M. Fetter of Louisville, Ky., secretary-treasurer, and B. R. Hutchcraft, Barboursville, Ky., general manager.

Lexington—Distillery.—Thomas E. Pepper and associates have organized as Thomas E. Pepper & Co., and will build a distillery.

Paducah—Knitting Mill.—Paducah Textile Co. has been incorporated, with capital of $20,000, to continue Alden Knitting Mills, recently leased to R. B. Phillips and Geo. C. Wallace; 100 machines are being added to eighty-one already in position.

Sturgis—Coal Mines.—Western Kentucky Consolidated Coal Co. has been incorporated by T. C. Renick of St. Louis, Mo.; T. J. Flornoy of Paducah, Ky.; Isaac Reese of Memphis, Tenn.; J. L. Frankel of Sturgis and others.

LOUISIANA.

Crowley—Rice Mill.—Hunter Bros. have awarded contract to J. A. Petty for erection of their proposed 1400-barrel rice mill.

Lake Charles—Drug Company.—Bailie Drug Co. has been incorporated, with H. A. Bailie of Houston, Texas, president.

New Iberia—Marble Quarry.—L. E. Marion, Box 268, and associates have discovered and will develop marble deposits; will erect works for sawing and polishing.*

New Orleans—Sugar Mills, etc.—Aristide L. Monnot, Lee A. Grevenberg, A. D. Foster, Jos. A. Fay and others have incorporated Vaufrey Sugar Planting & Manufacturing Co., Limited, with capital stock of $300,000, for manufacturing and refining sugar, to cultivate and operate sugar plantations, etc.

New Orleans—Coal Barge Lines.—W. J. Kelly of Tuscaloosa, Ala., is reported to have arranged for the organization of a $1,000,000 corporation to build barges and tugs for operation between New Orleans and the Alabama coal fields on the Warrior river, the coal to be supplied for marine service at this port. It is said M. J. Sanders of New Orleans is interested, and that John Hays Hammond of New York city will be the engineer in charge of plans.

MARYLAND.

Baltimore—Brush Factory.—Twentieth Century Brush Co. has been incorporated, with capital stock of $100,000, by James S. Patten, H. Stockton Startt, Martin H. Mulhall and others for dealing in brushes, brooms, etc.

Baltimore—Brush Factory.—Pittsburg Plate Glass Co. of Pittsburg, Pa., has acquired an interest in Rennous, Kleinle & Co., brush manufacturers, and will reorganize with capital stock of $175,000 and Wm. P. Bigelow, president; Parley W. Clark, secretary; will continue under firm name.

Baltimore—Electric-light and Power Plant. Central Manufacturers' Building Co. has been incorporated, with capital stock of $150,000, by Myer J. Block, Albert Weil, Isaac Coale, Jr., Richard C. White and Frank C. Tyson. This company was reported recently to be organized for erection of building to accommodate a number of manufacturers and supply them with light, heat and power; office, 409 Water street.

Baltimore—Carriage Factory.—William Knauss will prepare plans and erect the proposed carriage factory of James King; building will be four stories, of brick and stone, and cost $40,000.

Corbett—Silage Factory.—American Farm Co. will erect a factory for making silage.

Cumberland—Coal Mines.—Daniel W. Davis of Riddlesburg, Pa., has optioned and will develop coal properties in Garrett county.

Cumberland—Paper Mill.—Western Maryland Paper Co. has been incorporated, principal office at Parsons, W. Va., with authorized capital of $10,000, by Robert Roe, Jr., Agnus K. Roe, Wm. G. Conley, all of Parsons, and others. Company has purchased Cumberland Paper Co.'s plant, as recently reported, and will operate it, with other mills in West Virginia.

Hagerstown—Telephone Extension.—The syndicate which recently secured control of Maryland Telephone Co. has elected S. L. Johns of Hanover, Pa., president; Alexander Neill of Hagerstown, vice-president; John B. Kieffer of Hagerstown, secretary and treasurer; company will extend system from Hagerstown to Sharpsburg, connecting with several towns, with through copper trunk to Shepherdstown, W. Va., and make other improvements; P. B. Tebault, superintendent.

Salisbury—Cannery.—J. H. Tomlinson will erect a cannery.*

MISSISSIPPI.

Canton—Cotton-oil Mill.—Canton Oil Mill has increased capital stock from $30,000 to $50,000.

Ellisville—Ice and Cold Storage.—Ellisville Ice & Cold Storage Co. has been incorporated, with capital of $10,000, by W. P. Craft, John H. Cook, W. V. Walters, S. V. McManus and others.

Ellisville—Woodworking Factory.—W. E. Jones, J. P. Myer and C. S. Myer have incorporated Jones Side Harrow Co., with capital of $2000, for manufacturing side harrows, hoes, rakes, wheelbarrows, etc.

Jackson—Mercantile.—Jones-Kennington Dry Goods Co., with capital stock of $100,000, by J. A. Jones and others.

Kosciusko—Excelsior Factory.—Oldham Lumber Co. contemplates installing machinery for manufacture of excelsior from longleaf pine.

Mississippi—Timber-land Development.—James Meehan of Milwaukee, Wis., has purchased 15,000 acres of timber lands in Central Mississippi, and will erect saw-mill of 70,000 feet per day capacity provided with band and gang saws for developing the property; railroad for handling logs will also be constructed.

MISSOURI.

Carthage—Woolen Mill.—S. B. Griswold and Major Harrington are forming company to operate the Carthage Woolen Mill, adding to it a cutting and clothing department.

Excelsior—Water-works and Electric-light Plant.—Henry Ettenson of Leavenworth, Kan., is negotiating for the old water-works plant at Excelsior Springs, as lately reported, and intends to rebuild same; will also build an electric-light plant in connection.

Fairfax—Telephone Exchange.—Fairfax Telephone Exchange has been incorporated, with capital of $5000, by John H. Pinshon, Nelle Morgan and others.

Fredericktown—Lead Mines.—North American Lead Co. has been incorporated, with capital stock of $1,000,000, by M. C. Jordan, Elden L. Jordan, E. R. Darlington of St. Louis, Mo., and others.

Joplin—Mining.—Harriet & Helen Mining Co. has been incorporated, with capital of $20,000, by R. J. Fairbanks, F. C. Platt, Arthur F. Corbin and others.

Potosi—Lead Mines.—J. I. Epstein has purchased 1000 acres of lead-mining property, and will organize company to develop it.

St. Louis—Bill Posting.—Chartered: City Bill Posting Co., with capital of $25,000, by Frank W. Ries, J. Simon and John W. Ries.

St. Louis—Channelways, etc.—McIntyre & Teese have received contract at $18,500 for constructing two subsidiary channelways to carry the tributaries of the River Des Peres; contract provides for 3000 feet of sluice-boxes, 400 feet of brick sewer, manholes, ladders and piling.

St. Louis—Cotton Compress.—St. Louis Cotton Compress Co. is having plans made for erection of a new building to cost $100,000, and will change location of its plant.

St. Louis—Electric-light and Power Plant. Hill-O'Meara Construction Co., reported lately as having contract for erection of the proposed $2,000,000 electric-light, heat and power plant of the Citizens' Electric Light & Power Co., has contract for the foundation only, which amounts to $300,000. Plans for the superstructure are not yet prepared, but are expected to be out in a few weeks.*

St. Louis—Publishing.—Chartered: Optimist Publishing Co., with capital of $3000, by James L. Ennis, Frank G. Tyrrell, W. H. Wharton and others.

St. Louis—Tobacco Company.—Chartered: Christian Peper Tobacco Co. (established) has been incorporated, with capital stock of $1,000,000, by Christian Peper, Jr., Frederick C. Peper, Chas. G. Peper and others.

St. Louis—Manufacturing.—Chartered: A. F. Brase Manufacturing Co., with capital stock of $5000, by J. H. Tiemeyer, Anton Wind, A. F. Brase and others.

St. Louis—Laboratory.—Chartered: Roentgen Ray Laboratory Co., with capital of $5000, by Henry B. Vogelsang and others.

St. Louis—Printing.—Chartered: Mockler Printing Co., with capital stock of $10,000, by James E. Martin, F. J. Miner and E. L. Mockler.

NORTH CAROLINA.

Asheville—Repair Shops, etc.—Southern Railway Co., Frank S. Gannon, general manager, Washington, D. C., will make improvements at Asheville, which include erecting roundhouse, repair shops, coal-hoisting apparatus, etc.

Burlington — Handle Factory. — Southern Handle Manufacturing Co., lately reported incorporated, has elected Geo. W. Anthony, president; J. W. Murray, vice-president, and A. C. Holt, secretary-treasurer.

Burlington — Handle Factory. — Southern Handle Manufacturing Co., reported during the week, has plant already established with capacity of 10,000 handles per day, which will later on be increased to 20,000 per day.*

Clayton—Lumber Mills.—Horne & Vinson Co., reported recently as incorporated, absorbs Horne & Vinson, manufacturers of lumber, shingles, laths, etc.; company will install an additional planer.

Cullowhee—Copper Mines.—The Cullowhee Copper Co., recently reported incorporated with capital stock of $100,000, has acquired the two tracts of Cullowhee copper property of 400 acres and the Alice copper mine of 640 acres; company will place machinery and sink working shaft several hundred feet deep to open the mine, and will push work on both tracts as rapidly as possible; later it is proposed to erect a smelting and refining plant. D. D. Davies is president; R. E. Bowen of Easley, S. C., treasurer, and Thos. A. Cox, secretary. Address the secretary.*

Greensboro—Mercantile.—Chartered: Merritt-Johnson Company, with capital stock of $9000, and privilege of increasing to $20,000, by John W. Merritt and others.

Henderson—Bottling Works.—Robert Portner Brewing Co. of Alexandria, Va., is establishing a branch in Henderson, including refrigerating and cold-storage rooms, etc.

Hickory—Bridge.—Carolina & Northwestern Railroad will construct bridge across Catawba river near Hickory; L. T. Nichols, general manager, Chester, S. C.

Hickory—Water-works.—The Federal Guaranty & Trust Co. of Philadelphia, Pa., is investigating with a view to constructing water-works in Hickory.

Hickory—Woolen Mill.—J. A. Martin, T. J. Lutz, J. L. Latta of Hickory, J. R. Gaither of Newton, N. C., have incorporated Catawba Woolen Mills Co., with capital stock of $8000.

High Point — Upholstering. — Chartered: High Point Upholstering Co., with capital stock of $125,000, by Percy V. Kirkman, E. M. Armfield, J. J. Welch and others.

High Point — Veneering Factory. — High Point Veneering Co., for the manufacture of veneering and excelsior, has completed organization with J. A. Clinard, president; M. J. Wrenn, vice-president; J. W. Clinard, secretary-treasurer.

Littleton—Silk Mill.—The establishment of silk mill is talked of. H. J. Cordle can give information.*

Lumberton—Roanoke Railroad & Lumber Co., Norfolk, Va., will not build mill at Lumberton, as was lately reported.

Mooresville—Creamery.—C. G. Voight of Harrisonburg, Va., is interested in the establishment of a creamery at Mooresville.

Mt. Holly — Electric-light Plant. — A. P. Rayne & Co. are installing an electric-light plant.

Nashville—Lumber Company.—Nash County Lumber Co. has been incorporated, with capital of $25,000, by Henry A. Gilman of Tarboro, N. C.; S. F. Austin of Nashville, N. C., and L. F. De Bordenave of Norfolk, Va.

Raynham—Lumber Company.—Chartered: Raynham Supply Co., with capital stock of $20,000, for conducting general lumber and mercantile business.

Sylva—Furniture Factory.—American Lumber Co. will, it is reported, erect a furniture factory.

Tarboro—Knitting Mill.—It is probable that company will be formed to rebuild Riverview Knitting Mills, recently burned. John F. Shackleford was proprietor.

Troy—Lumber and Supply Company.—Wade Lumber & Supply Co. has been incorporated, with capital of $3000, by Fred H. Wade, B. T. Wade and O. M. Wade.

Washington—Cotton Mill.—The erection of a mill for manufacturing cotton batting and comforts is talked of. J. Havens can give information.*

Washington—Light and Water Company.—Washington Light & Water Co. has been incorporated, with capital stock of $20,000, by S. J. Sprinks, Geo. T. Leach, A. N. Walker and others.

Wilmington—Fertilizer Factory, etc.—Armour & Co. of Chicago have leased property at Wilmington, which will be used as warehouse and mixing plant for fertilizers. It is also reported that the company will later on erect large fertilizer factory at this point.

Wilmington — Bottling Works. — Home Brewing Co. (principal office, Richmond, Va.) will enlarge its Wilmington plant by doubling cold-storage capacity to four carloads of beer, install new bottling machinery, steam sealer, patent rinsing machinery and a crown machine.

Wilmington — Kindling-wood Factory. — American Wood Specialty Co., 29 Broadway, New York, is reported as having purchased site in Wilmington and to erect a building and wharf at a cost of $50,000 for the manufacture of kindling wood for European market.

Winston—Knitting Mill.—Shamrock Knitting Mills is reported as to increase its equipment of machines.

SOUTH CAROLINA.

Anderson—Cotton Mill.—Orr Cotton Mills is reported as considering the erection of another mill, to contain 25,000 spindles.

Enoree—Cotton Mill.—Enoree Manufacturing Co. will increase capital from $400,000 to $700,000; now has 30,720 spindles and 902 looms.

Fairfax—Mercantile.—F. M. Young Co., with capital stock of $15,000, has been incorporated by F. M. Young (president) and others.

Gaffney—Bleachery, Printery, Mercerizing Plant, etc.—Gaffney Manufacturing Co., H. D. Wheat, president, telegraphs that company's additional two-story 100x350-foot building, now being constructed, will be equipped for bleaching, dyeing, mercerizing and printing yarns and piece goods, company's mill being changed from plain to fancy weaving in this connection; now has 67,040 spindles and 1401 looms.

Gaffney — Cotton Mill. — Gaffney Carpet Manufacturing Co. will add 100 looms.

Gaffney—Cotton Mill, Bleachery, etc.—A correspondent writes that it is understood the Gaffney Manufacturing Co. will build another mill to manufacture fine goods; also a bleachery and dyeing plant.

Lancaster—Brick Works.—Pong & Harper will establish brick works.

Leesville — Mercantile. — Chartered: Matthews & Bouknight Co., with capital of $50,000, by J. L. Matthews and others.

Mullins—Mercantile.—Chartered: Palmetto Grocery Co., with capital of $5000, by John P. Cooper and others.

Orangeburg — Mercantile. — Chartered: Orangeburg Dry Goods Co., with capital of $5000, by I. S. Harley (president) and others.

Orangeburg — Sheet-iron, etc., Plant. — Southern Metal Co., for manufacture of sheet iron, etc., has been incorporated, with capital stock of $10,000. William S. Barton is president.

Union—Drug Company.—Union Wholesale Drug Co. has been organized, with capital of $5000, by C. E. Lipscomb and others.

Walterboro—Cotton Mill.—Colleton Cotton Mills will erect additional building, four stories, 65x75 feet, probably to accommodate new machinery; construction bids are asked; company has 5000 spindles and 136 looms.

TENNESSEE.

Athens—Knitting Mill.—R. J. Fisher will establish knitting mill of thirty machines and thirty-two ribbers; steam-power.

Charlotte—Flour Mill.—C. B. Thornburg of Dickson, Tenn., will erect a 50-barrel flour mill at Charlotte.

Chattanooga.—Chartered: Vacuum Drying Machine Co., with capital stock of $39,000, by Chas. Herron, Chas. L. Hesse, R. H. Williams and others.

Chattanooga — Plow Factory. — W. B. Michael will organize the Dixie Farm & Implement Co. and erect factory for the manufacture of his patent automatic adjustable scraper for a disc plow.

Chattanooga — Singletree Factory.—Southern Singletree Co. has been incorporated, with capital of $10,000, for the manufacture of singletrees, by Chas. Heron, Ed. Heron, R. H. Williams and others.

Cookeville—Oil Wells.—Washington Oil Co. has been organized for developing oil wells. Henry Algood is president; Michael Moore, treasurer, and Geo. E. Morgan, secretary.

Crossville—Stave Plant.—M. L. Nestor & Son contemplate installing machinery for manufacture of tight staves.

Elizabethton — Lumber Company.— Mount Lumber Co. has been incorporated, with capital of $30,000, by John W. Tipton, Lee F. Miller, James D. Jenkins and others.

Jellico—Oil and Gas Wells.—Jellico Oil & Gas Co. has been incorporated, with capital stock of $25,000, by W. T. Lewis, R. S. Forman, J. T. Bradley and others.

Johnson City—Planing Mill.—J. D. Weaver & Sons have purchased handle factory, and will equip it as a planing mill.

Kenton—Brick and Tile Works.—Kenton Brick & Tile Co. has been incorporated, with capital of $10,000, by George P. Hurt, C. A. Derryberry, B. L. Glissan and others.

Knoxville—Printing.—Chartered: Paragon Printing & Publishing Co., with capital stock of $10,000, by Chas. B. Carter, James A. Anderson, Hugh M. Johnson and others.

Knoxville—Trunk Factory.—Cary F. Spence has purchased an interest in Whittle Trunk Co. and reorganized it as the Whittle-Spence Trunk Co., with increased capital of from $25,000 to $50,000. Capacity of plant will be enlarged and output increased.

Knoxville—Paste and Polish Company.—American Paste & Polish Co. has been incorporated, with capital of $10,000, by M. D. Arnold, Edward Henegar, F. C. Hunt and others.

McMinnville—Oil Wells.—Interstate Oil & Gas Co. has been incorporated, with capital stock of $250,000, by C. C. Ellis, P. S. Griffith, J. W. Clift of Chattanooga, Tenn.; B. W. Sparks and others.

Memphis—Lumber Plant.—W. K. Merrick of Dillsboro, Ark., is investigating with a view to establishing large lumber plant at Memphis.

Morristown — Road Improvements.—Hamblen county has voted issuance of $50,000 of bonds for road improvements. Address "County Clerk."

Nashville — Mercantile. — Chartered: Bon Ton Cafe & Restaurant Co., with capital of $1000, by E. H. Marcus, Chas. Ott, A. M. Vandeve and others.

Nashville—Livery.—Chartered: W. H. Key Livery Co., with capital of $2500, by W. H. Key and others.

Tazewell—Coal Mines.—Nicholson Coal Co., with capital stock of $30,000, has been incorporated by W. F. Nicholson, E. P. Nicholson, F. D. Clifford and others.

Whiteville — Mercantile, etc. — Chartered: Whiteville Mercantile & Hardware Co., with capital stock of $20,000, by Thomas Polk, S. N. Duncan, W. H. Crowder, T. B. Smith and others.

TEXAS.

Ballinger — Telephone Company.— Central Texas Telephone Co. has been incorporated, with capital stock of $50,000, by L. C. Alexander, A. Schane, John B. Wilmeth and others.

Beaumont—Oil Wells.—It is reported that John W. Gates of Chicago and New York is interested in the organization of a $10,000,000 company for developments in the Beaumont oil district.

Beaumont—Cement Plant.—Myrick Bros. have purchased shell bank at the mouth of Neches river, and are making extensive improvements; wharf has been constructed, upon which a tramroad is being constructed; the installation of a rotary lime-kiln is contemplated to manufacture cement from shells. Address W. A. Myrick.

Beaumont—Gas System.—A system to utilize the supply of gas on Spindle Top will probably be established. Chas. A. Tieb is interested.

Beaumont—Oil Wells.—One Penny Oil Co. has been incorporated, with capital stock of $1,000,000, by Frank H. Morrical, T. C. Woodin, M. Wisdom, A. McArthur and others.

Beaumont—Oil and Fuel Company.—Union Oil & Fuel Co. has been incorporated, with capital stock of $500,000, by J. F. Keith, B. Rush Norvell, Robert Steiner and others.

Bryan—Stock-raising.—Chartered: Brazos River Farm & Stock-Raising Co., with capital stock of $50,000, by W. A. Bell, James W. Carson, Robert F. Smith and others.

Canyon—Hardware Company.—Chartered: Donohoo-Ware Hardware Co., with capital stock of $25,000, by J. N. Donohoo, R. C. Ware and others.

Celeste—Hardware and Furniture.—Chartered: Henslee Hardware & Furniture Co., with capital of $10,000, by G. W. Henslee, G. K. Cheatham, D. A. Tuney and others.

Center Point — Mercantile. — Chartered: Farmers' Mercantile Co-operative Association, with capital stock of $10,000, by W. D. C. Burney and others.

Cleburne.—Chartered: Nix & Baird Company, with capital stock of $50,000, by A. W. Baird, H. C. Gresham and others.

Dallas—Electric-light and Power Plant.—Dallas parties have asked for franchise for establishing an electric-light and power plant. Address Mayor Benjamin Cabell.

Dallas — Repair Shops, Depots, Roundhouses, etc.—Dallas Terminal Railroad will make arrangements to complete its improvements at Dallas, which include building of depots, roundhouses, and perhaps a large repair shop; W. C. Connor, president.

Denton — Brick Works.—Denton Pressed Brick Co., with capital stock of $30,000, has been incorporated by Wm. Bryce, W. S. Wilson, W. M. Dugan and others.

El Paso—Sash and Door Factory.—El Paso Sash & Door Co. has been incorporated, with capital stock of $20,000, by J. B. W. Burton, I. A. Shed and J. H. Russell.

El Paso—Mining.—United Four Mining Co. has been incorporated, with capital stock of $50,000, by S. C. Pratt, Frank Lewell and Wm. H. Burges.

Fort Worth—Granite Works.—Chartered: Fort Worth Electric Stone Mill and Granite Works, with capital stock of $10,000, by David Hughes, Morgan Evans and J. A. Brown.

Fort Worth—Mercantile.—Chartered: Columbia Dry Goods Co., with capital stock of $50,000, by Marcus Alexander and others.

Galveston—Land, Oil and Gas Company.—Galveston Land, Oil & Gas Co. has increased capital stock from $20,000 to $40,000.

Houston—Oil Wells.—Sunny South Oil Co., with capital stock of $150,000, has been incorporated by S. R. Perryman, F. B. King, B. R. King and others.

Houston—Iron and Steel Company.—Peden Iron & Steel Co. has been incorporated, with capital stock of $250,000, by D. D., E. A. and D. D. Peden, Jr., for dealing in roofing materials, plumbers' supplies, sheet iron, tin plate, etc.

Houston—Rice Mill.—Philip Rahen has received contract for erection of the proposed rice mill for Houston Rice Milling Co.; it will consist of mill with capacity of 1000 barrels per day, warehouses, etc.; cost $40,000.

Houston—Showcase, etc., Factory.—Houston Showcase Manufacturing Co., reported recently as incorporated, is an enlargement of Houston Showcase and Cabinet Works; new two-story factory 66x100 feet will be erected at once; J. S. Purdy, secretary.*

Jefferson—Cotton Mill.—The citizens propose organizing company to build cotton factory. T. D. Rowell and W. S. Haywood are interested.

Kirbyville—Mercantile.—Chartered: Lanier Mercantile Co., with capital stock of $20,000, by R. C. Lanier and others.

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Mabank — Mercantile.—Chartered: Meeks-Strait Mercantile Co., with capital stock of $18,000, by J. H. Strait and others.

Marfa—Mining and Quicksilver Furnace.—Texas Cinnabar Mining Co. has been incorporated, with capital stock of $100,000, by H. W. McGuirk, F. E. Gillett, H. H. Kilpatrick and others for installation of 20-ton furnace to produce quicksilver.

Moody—Flour Mill.—Moody Mill & Eleva-

tor Co. has closed contract for erection of 100-barrel flour mill.

Port Lavaca—Bottling Works.—Justice F. S. Montier is establishing soda bottling works.

Roby—Water-works.—Roby Water Supply Co., reported recently as organized for construction of water-works, has been incorporated, with capital of $5000, by J. N. Weakley, Ed. Hooper, James P. Green and others.

Seguin—Brewery.—Chartered: Pilesner Brewing Co., with capital stock of $150,000, by J. A. Kolin, C. F. Schultze and J. E. Jell.

Sherman—Ice Company.—Sherman Ice Co. has increased its capital stock from $75,000 to $125,000.

Trinity—Telephone System.—Chartered: W. A. Bell Telephone Co., with capital of $1000, by W. A. Bell, R. W. B. Martin and B. G. Dyne.

Trinity—Water-works.—Trinity Water-Works & Improvement Co. has been incorporated, with capital of $5000, by D. E. Barnes, J. B. Peyton and W. A. Bell.

Troupe—Cannery.—Proposition for establishment of a cannery is being considered. Address Truck-Growers' Association.

Vernon—Cotton Mill.—J. D. Haler has a proposition from a Northern manufacturer to locate a $50,000 cotton mill if local investors will give a $10,000 bonus.

Waco—Levee.—City has made an appropriation of $20,000 for construction of a levee. Address "The Mayor."

Wallisville—Irrigation Canal.—Old River Rice Irrigation Canal & Milling Co. has been incorporated, with capital stock of $50,000, for constructing a rice irrigation canal. Dr. T. W. Shearer is president; J. R. Wooten, vice-president; Dr. A. R. Shearer, secretary-treasurer.

Wichita Falls—Broom Factory.—Critis Broom Manufacturing Co. has been incorporated, with capital of $5000, by E. J. Critis, C. W. Wilson and B. J. Bean.

Wichita Falls—Water-works.—Wichita Falls Water-Works Co. has been incorporated, with capital stock of $50,000, by M. Lasker of Galveston, J. A. Kemp and W. L. Berger of Wichita Falls.

Wichita Falls—Telephone Company.—Texas Telephone Co. has increased capital stock from $12,000 to $24,000.

VIRGINIA.

Ashland—Pickle Factory.—E. L. C. Scott, Chas. Stebbins, T. R. Scott and others are interested in the establishment of a pickle factory.

Berkley—Winery.—Garrett & Co. of Weldon, N. C., will establish a winery at Berkley, as reported lately; will install about 200,000 gallons of cooperage, with necessary machinery for crushing grapes and distilling the refuse.

Blackstone—Telephone Company.—Chartered: Blackstone Telephone Co.

Blackstone—Handle Company.—Chartered: Blackstone Hand-Shaved Handle Co.

Cape Charles—Denney Galvanic Paint Co. has been incorporated, with Josephus F. Bussels, president; L. E. Mumford, vice-president, and J. B. Jones, secretary-manager, for the manufacture of paint.

Cape Charles—Telegraph System.—The property of New York, Philadelphia & Norfolk Telegraph Co. has been conveyed to New York, Philadelphia & Norfolk Railway Co. for $70,000; line extends from Cape Charles to King's creek, and is leased by the Postal Telegraph & Cable Co.

Carroll County—Timber Development.—Kinzer & Gardner of Hillsville, Va., who recently purchased large tract of timber in Carroll county, will commence to saw and ship the lumber at an early date.

Emporia—Electric Plant, Ice Factory and Telephone System.—W. F. Deal, W. Sanford Goodwyn, H. Schwartz, E. S. Robinson and others have organized Emporia Light & Power Co. for establishment of electric-light plant and ice factory; company has taken over the local telephone lines, and will consolidate the three enterprises.

Fredericksburg—Brick Works.—Virginia Brick Co. has been incorporated, with capital stock of $30,000, for manufacture of front and ornamental bricks, by H. Warden, W. D. Carter, F. A. De Costa and others.

Fredericksburg—Winery.—Henry Dannehl Company has been chartered for the manufacture of wine from grapes. Henry Dannehl is president and general manager; Valentine Dannehl, vice-president, and August Dannehl, secretary-treasurer.

Grayson—Iron Furnace.—Capt. J. P. Robinson of Danville, Va., and Pittsburg (Pa.) parties are investigating with a view to erecting an iron furnace at Grayson if sufficient ore can be found.

Montpelier—Oil Company.—Great Western Oil Co. has been incorporated, with capital stock of $750,000, by T. J. Driscoll, John Kerlin, D. H. Bryson, L. E. Maddox and others.

Norfolk—Street-sweeper Factory.—D. D. Hitchings has patented a street sweeper, and will erect a factory for manufacturing same.

Norfolk—Paving, Sewers, Water Improvements, etc.—The city, reported lately to complete sewerage system, is preparing specifications for $450,000 worth of grading, Belgian blocks and asphalt paving, sewers and water system. J. D. Armstrong, chairman local board of improvement, may be addressed.

Norfolk—Brick Works, etc.—Buckeye Company has been incorporated to deal in real estate, manufacture bricks and other clay material, with capital stock of from $40,000 to $60,000; T. J. Campbell, president; O. D. Jackson, vice-president; A. J. Fowler, secretary, and C. E. Hyter, treasurer.

Petersburg—Cotton Mill.—It is reported Ettrick Manufacturing Co. has definitely decided to expend for improvements the $50,000 reported recently as contemplated.

Portsmouth—Construction Company.—Tidewater Construction Co. has been incorporated, with capital of $5000, for construction of railways, grading roads and streets, erection of buildings, etc., with D. G. Porter, president; J. F. Pace, vice-president, and H. F. Butt, Jr., secretary-treasurer.

Portsmouth—Machine Shops.—It is said that the Seaboard Air Line will expend a large amount in enlargement and improvement of its Portsmouth shops; J. M. Barr, general manager.

Radford—Broom and Mattress Factory.—Radford Broom & Mattress Co., G. A. Sullivan, general manager, will soon have in operation its plant for the manufacture of brooms and mattresses.

Richmond—Warehouse Company.—Chartered: Security Warehouse Co., with capital stock of $250,000, to operate in the State of Virginia.

Rural Retreat—Mineral Lands.—M. M. Caldwell has sold 2000 acres of mineral land to parties who will build tramroad and develop same.

Salem—Oil, Gas, Coal, etc., Lands.—Scholz Bros. & Smith of Roanoke, Va., have purchased 40,000 acres of land in Roanoke, Craig and Montgomery counties, and will prospect for gold, coal, oil, gas and glass sand. The prospects for oil and gas are such as to induce purchasers to ask for franchise to light and heat Roanoke and Salem. W. H. Tinsley of Salem may be addressed regarding particulars.

Warren—Water-power-Electrical Plant.—Lane Bros. & Co. will build an electric-power plant to cost $200,000 on the James river near Warren city, about 3000 horse-power to be available. Water-power development will furnish the energy that will be transmitted electrically to manufacturing industries. David H. Pitts is representative at Richmond.

Whitties Depot—Saw-mill.—C. G. Watson and F. J. Wooding have purchased and will operate saw-mill with capacity of 15,000 feet per day.

Wytheville—Telephone System.—Wythe County Mutual Telephone Co. has been incorporated for construction of telephone system. Andrew L. Porter is president, and G. B. Sexton, secretary-treasurer.

WEST VIRGINIA.

Charleston—Brick Plant.—Kanawha & New River Fire-Brick Co., recently incorporated, has awarded contract for erection of works with capacity of 2,000,000 bricks per day.

Charleston—Coal Mines.—Elk Coal Co. has been incorporated, with capital stock of $75,000, to conduct general coal and lumber business, by C. H. Duling of Charleston, G. A. Miller of Hinton, G. E. Turner of Baltimore, Md., and others.

Charleston—Lumber Company.—Union Lumber Co. has been incorporated, with capital of $30,000, by G. W. Barricklow, H. W. Barricklow and others of Connellsville, Pa.

Clarksburg—Coal Mines, etc.—Short Line Fuel Co. has been incorporated to conduct general coal and coke business, by Jesse V. Hoover of Masontown, Pa., and others; capital authorized is $294,420.

Clarksburg—Candy Factory and Bakery.—Walthour Candy Co., reported recently as incorporated, has purchased machinery for complete candy-manufacturing plant and bakery; capacity of latter 5000 loaves per day.

Clarksburg—Glass Factory.—M. R. Bennett, representing New York Suburban Land Co., is reported as conferring with Clarksburg Board of Trade relative to site on which to erect a $270,000 glass factory. Recently New York parties were considering a proposition to locate a glass factory at Fairmont.

Colfax—Brick Works.—J. F. Fulton and J. P. Conn of Uniontown, Pa., have purchased the Colfax Red Brick Works, will improve and operate them. It was reported recently that company would be organized to improve and operate these works.

Elkins—Lumber Mill.—Cheat River Lumber Co., reported recently as incorporated to succeed J. M. Woodford in the manufacture of lumber, will, it is said, erect new plant.

Fairmont—Check-hook Works.—It is reported that Backus Safety Check Hook Manufacturing Co. of Smethport, Pa., will establish works in Fairmont.

Fairmont—Brick Works.—Hutchinson-Barns Brick Co. has been incorporated, with capital of $25,000, for manufacture of bricks, etc., by C. E. Hutchinson, M. L. Barns and A. B. McDonald.

Fayetteville—Coal Mines.—N. Daniel, County Clerk Grose and Dr. M. M. Malcolm have leased coal properties on Bell creek, and will develop.

Keyser—Gas, Electric-light and Power Plants.—Keyser Gas, Light & Mineral Co. has been incorporated for manufacturing and supplying gas, electricity, lights, heat and power, with authorized capital of $100,000, by James B. Rees, Chas. J. Kelley, Chas. N. Finnell and others.

Montgomery—Foundry.—Lawrence Markey of Clifton Forge, Va., has, it is reported, purchased the Montgomery foundry, and will improve and rehabilitate it.

Parkersburg—Handle Factory.—The Old Hickory Co. will increase its capital from $20,000 to $40,000 and install new machinery in its handle factory.

Richwood—Saw-mills.—Roane & Curli Lumber Co. of Weston, W. Va., has purchased several thousand acres of timber lands in Nicholas county near Richwood, and will erect mills for cutting the lumber.

INDIAN TERRITORY.

Haileyville—Electric-light and Ice Plant.—Chartered: Haileyville Electric Light & Ice Co., with capital stock of $50,000, by D. M. Hailey, James Elliott, L. W. Bryan and others.

Hugo—Cotton-oil Mill and Gin.—The $75,000 company recently reported organized for erection of cottonseed-oil mill and gin is known as Hugo Cotton Oil & Gin Co.; capacity of mill and gin will be sixty tons and 100 bales per day; machinery and material will be contracted for within sixty days; J. W. Parsons, secretary, Ladonia, Texas.*

South McAlester—Electric-light Plant.—Indian Territory Traction Co. will be granted franchise for lighting purposes.

Sulphur—Mining.—Arco Mining Co. has been incorporated, with capital stock of $25,000, by Jacob H. Wright, Theodore H. Ellis, C. J. Webster and others.

Tulsa—Mining.—Tulsa Mining & Development Co., with capital of $25,000, by H. H. Radley, F. W. Brown and T. W. Shockle.

Wagoner—Hardware Company.—Chartered: Wagoner Hardware Co., with capital of $30,000, by T. Parkinson of Wagoner, C. W. Turner of Muscogee, F. A. Parkinson of Wagoner, secretary.

Wagoner—Realty Company.—Chartered: Creek-Cherokee Realty & Development Co., with capital stock of $500,000, by J. C. Casaver, S. P. Beardsley, R. V. Leonard and others.

OKLAHOMA TERRITORY.

Addington—Cotton Gin.—John Slayton of Bowie, Texas, representing D. and W. S. Waggoner, and A. J. McNeil of Stoneburg, Texas, has purchased the Addington Cotton Gin, and will replace it with an entirely new structure, etc.

Egmond—Building Association.—Chartered: Oklahoma Mutual Home Building Association, with capital stock of $500,000, by G. H. Wahl, J. H. Coffey, E. R. Felt and others.

Lawton.—Texas Oil & Mining Co. has been incorporated, with capital stock of $2,000,000, by J. D. Kennard of Cuba, Texas; W. D. Quinn, G. A. Harrell, J. A. Hill of Grandview, Texas, and others.

Oklahoma City—Realty Company.—Chartered: The Classen Company, to deal in realty and contract for municipal improvements, with capital stock of $150,000, by Anton Classen, Geo. F. Gardner, E. W. Johnston and Geo. H. Brauer.

Oklahoma City.—Chartered: Johnston-Larimore Company, with capital stock of $50,000, by J. H. Johnston of Galveston, Texas; Geo. L. Larimore, A. K. Crews and others.

Oklahoma City—Mercantile.—Oklahoma Wholesale Grocery Co. has been incorporated, with capital stock of $45,000, by Henry N. Mills of Kansas City, Mo.; Marion S. Cooter and others.

Shawnee—Cotton Mill.—Shawnee Electric Light & Power Co. contemplates erecting a cotton mill of 3000 to 5000 spindles, to be driven by electrical power.*

Shawnee—Telephone Company.—Long Distance Telephone Co. has been incorporated, with capital stock of $100,000, by James F. Noble of Shawnee, Eugene D. Nimms of Roff, I. T., and James L. Lombard of Kansas City, Mo.

Walters—Grist Mill and Gin.—Russell Peck of Cleveland county will, it is said, establish a large grist mill and cotton gin at Walters.

BURNED.

Hays, Ky.—C. Morrison's flour mill; estimated loss $6000.

Meridian, Miss.—Wyatt & Culpepper's broom factory.

Selma, Ala.—International Cottonseed Oil Co.'s grist mill; estimated loss $50,000.

Sumter, S. C.—Ice Factory.—Independent Ice Factory; estimated loss $15,000.

Tampa, Fla.—Tampa Lumber Co.'s plant; estimated loss $25,000.

BUILDING NOTES.

Anniston, Ala.—Hotel.—Chas. W. Carlton & Co., 13 Caldwell Building, are preparing plans for five-story, 150-room hotel, to be erected by W. H. Zinn and associates.

Atlanta, Ga.—Business Building.—Lamar Jones has prepared plans for three-story brick building to cost $25,000, to be occupied by Keely Company.

Atlanta, Ga.—Mome.—A. McGilvary & Co. have received contract at $22,775 for erection of Confederate Soldiers' Home, to replace one previously burned; new building will be two stories, of wood, brick and stone.

Baltimore, Md.—Apartment-house.—Charles E. Cassell has completed plans for proposed apartment-house of Frank H. Trimble & Bro., and bids for construction material are now being made. It will be six stories high, brick and stone, 81x100 feet, and cost $175,000.

Bay City, Texas—Business Building.—Gaines, Holland & Higgins are erecting two-story office building.

Beaumont, Texas—City Hall, etc.—Kaufman & Son have completed plans for city's proposed new City Hall and central fire station, and bids will be received at once for erection; it will be three stories, of pressed brick, 56x112 feet.

Birmingham, Ala.—Office Building.—Contract for the proposed 10-story brick office building for Birmingham Loan & Trust Co. has been awarded to T. C. Thompson & Co.; cost $150,000.

Cameron, W. Va.—Bank Building.—John J. Rea, of Clarington, Ohio, has received contract for erection of proposed $12,000 building for First National Bank.

Carthage, Texas—Bank Building.—First National Bank, organizing by E. S. Woodvin and L. J. Smith of Shreveport, La., will erect a fireproof structure.

Columbus, Ga.—Church.—C. C. Wilson of Columbia, S. C., has completed plans for proposed St. Paul Church, and bids are being received from contractors for a $30,000 structure of white brick.

Concord, N. C.—Schools.—Hook & Sawyer of Charlotte, N. C., will prepare plans for schools, for which $25,000 of bonds were recently issued.

Durham, N. C.—Dormitory.—Plans of Hook & Sawyer of Charlotte, N. C., have been accepted for proposed $25,000 dormitory for Trinity College; Dr. J. C. Kilgo, president.

Greers, S. C.—Hotel.—It is reported that Victor Manufacturing Co. will erect a hotel and several tenant houses.

Hopkinsville, Ky.—Exchange Building.—Cumberland Telephone & Telegraph Co., James E. Caldwell of Nashville, Tenn., president, will erect large exchange building in Hopkinsville.

Houston, Texas—Business Building.—Wells-Fargo Express Co. will erect a two-story brick building to cost $15,000; contract not awarded as yet.

Huntsville, Ala.—Buildings.—Architects Herbert Cowell and E. L. Love have plans and drawings for several costly buildings.

Huntsville, Ala.—Department Stores Building.—Department store, five stories, with elevators and all modern improvements, will be erected. Address Bruce Armstrong.

Jonesboro, Tenn.—Jail and Residence.—Henry Hoss, A. M. Stuart and J. S. Ford, committee, will open bids March 15 for erection of county jail and jailer's residence in accordance with plans and specifications on file.

Key West, Fla.—Armory.—Plans of Frank Russell have been accepted for proposed armory of Key West Guards. "City Clerk" will ask for bids on erection, and plans and specifications are on file with him. Building will be two stories, of wood, 50x80 feet.

Knoxville, Tenn.—Dwelling.—Gen. John T. Wilder will erect a $10,000 residence.

Mangum, O. T.—Courthouse.—Courthouse to cost $50,000 will be erected. Address "County Clerk."

Mannington, W. Va.—Business Block.—I. O. O. F., Eastern Star Lodge, will erect a three-story building 70x50 feet, containing business rooms, flats and large hall.

Marietta, Ga.—Jail.—John Awtrey, ordinary, will open bids April 15 for erection of jail, reported last week; building will be two stories, 40x87 feet, of brick, stone and iron, and built according to plans and specifications on file at ordinary's office and at office of J. W. Golucke & Co., Temple Court, Atlanta, Ga. Certified check for $500 must accompany each bid. Bond required and usual rights reserved.

Middlebourne, W. Va.—Bank Building.—First National Bank (organizing) will erect bank building.

Moundsville, W. Va.—Penitentiary Buildings.—C. W. Dowling of Williamstown, W. Va., has received contract at $21,367 for erecting chapel, dining-room and photograph gallery at State penitentiary.

Mt. Savage, Md.—Bank Building.—First National Bank (organizing) will erect a fireproof structure. Address Jas. Blays.

Nacogdoches, Texas—Jail.—County will build $20,000 jail. Address "County Clerk."

Nashville, Tenn.—Theater.—Frank Cox of Chicago, Ill., has contract for rebuilding Vendome Theater at a cost of $40,000.

New Lewisville, Ark.—Courthouse.—D. L. King, commissioner, will open bids March 8 for all labor and material required for erection and completion of courthouse in accordance with drawings and specifications, which can be seen at clerk's office, and at office of Frank W. Gibb, 112½ Louisiana street, Little Rock, Ark. Certified check for $500 must accompany each bid. Bond required and usual rights reserved.

Newport News, Va.—Brewery Building.—West Richardson has received contract at $62,000 for the masonry and carpenter work on building for Warwick Brewing & Ice Co.

Norfolk, Va.—Hotel.—New Atlantic Hotel, reported recently as burned and to be rebuilt, will be a 12-story structure 250x202 feet. Address C. H. Randolph.

Norfolk, Va.—Church.—Contract for proposed Ghent Presbyterian Church has been awarded to E. Tatterson; cost $35,000.

Portsmouth, Va.—Rectory.—Trinity Protestant Episcopal Church, Rev. A. C. Thomson, pastor, will erect brick rectory to cost $5000.

Raleigh, N. C.—Dormitory.—Plans of Barrett & Thompson have been accepted for rebuilding Watauga Memorial of A. and M. College, previously reported burned; W. P. Rose is preparing plans for an additional building to contain dining-room, college chapel and library; cost of two buildings will be $26,000.

Raleigh, N. C.—Auditorium.—The Auditorium Company has decided to arrange for immediate erection of its building previously mentioned; plan calls for structure 100x84 feet, one story high, and of galvanized iron and brick, with seating capacity for 3000.

Richmond, Va.—Store Building.—L. Hankins is having plans made by W. C. West for erection of two stores.

Richmond, Va.—Casino.—D. Wiley Anderson has completed plans for the brick casino to be erected at Westhampton Park at a cost of $20,000, and contracts will be awarded at once.

Sanford, N. C.—School.—D. L. Way, secretary bond trustees, will open bids March 17 for erection of school building according to plans and specifications on file with City Clerk M. S. Brown, 235 West Bay street, Jacksonville, and W. B. Talley, 513 Roberts street, Savannah, Ga. Each bid must be accompanied by certified check for 2 per cent. of amount of bid. Bond required and usual rights reserved.

St. Louis, Mo.—Clubhouse.—Southern Lumbermen's Association, Carl F. Drake of Austin, Texas, president, will erect a $50,000 club building on the exposition grounds in St. Louis.

St. Louis, Mo.—School.—Board of education has purchased site at $25,000 for erecting its proposed North St. Louis High School, to cost $200,000.

Taylorsville, N. C.—Courthouse.—B. F. Smith Fireproof Construction Co. of Washington, D. C., has received contract at $12,000 for erection of new county courthouse at Taylorsville, after plans by B. F. Smith.

Union, W. Va.—Courthouse.—Monroe county has awarded contract to B. F. Smith Fireproof Construction Co. of Washington, D. C., at $7500 for remodeling jail and building fireproof record-rooms on plans of B. F. Smith.

Villa Rica, Ga.—Stores.—Mr. Brunought of Avondale, Ala., will erect two stores. A. Ayers & Son will erect two-story brick and granite building.

RAILROAD CONSTRUCTION.

Railways.

Baltimore, Md.—It is reported that the Maryland & Pennsylvania Railroad is to improve its line between Baldwin and Fallston, the plan including a steel viaduct across the Little Gunpowder river.

Beaumont, Texas.—It is announced that an electric railroad connecting Beaumont with the Spindle Top oil fields will be completed by early spring.

Birmingham, Ala.—It is reported that the Illinois Central Railroad is to build the proposed line between Decatur and Jasper, Ala., to extend it at first to Tuscaloosa, and then to Jackson, Miss.

Burnet, Texas.—Dayton Moses, representing the Houston & Texas Central Railway Co., is quoted as stating that work is to begin shortly upon the line twenty-two miles long between Burnet and Lampasas. Contract has been awarded.

Chattanooga, Tenn.—It is reported that the Southern Railway Co. is planning extensive improvements upon its line between Memphis and Corinth.

Chattanooga, Tenn.—The Lookout Mountain Land & Improvement Co. is to be capitalized at $300,000 to develop Lookout Mountain as a summer resort, and in that connection to build an electric railroad.

Clarksburg, W. Va.—Baltimore & Ohio surveyors have begun work upon the route for a new track to connect with the West Virginia Short Line at Junction.

Columbia, S. C.—Application has been made for a charter for the Rock Hill Railroad Co., which proposes to construct a railroad between Rock Hill and Hermon, in York county. The capital is $10,000, and Mr. T. J. Roddey and others of Rock Hill are the incorporators.

El Paso, Texas.—It is announced that the Santa Fe system will build a road from Roswell, New Mexico, to El Paso, a distance of 100 miles.

Enfaula, I. T.—It is reported that work will begin at once upon the yards of the Choctaw, Oklahoma & Gulf Railroad at Enfaula.

Fort Smith, Ark.—A bill has been introduced in the United States Senate granting the St. Louis & San Francisco Railroad right of way from a point on its main line between Claremont, I. T., and Chandler, O. T., through the two Territories, so as to reach Fort Smith, Ark.

Frederick, Md.—The Baltimore & Frederick Electric Railway Co. proposes to build an electric road connecting Baltimore and Frederick and crossing at right angles the route of the proposed railroad from Washington through Westminster to Gettysburg.

Fredericksburg, Va.—The Richmond, Fredericksburg & Potomac Railroad, it is reported, is contemplating the straightening of its line in Caroline county to do away with a bend near Penola Station, whereby about three miles will be saved.

Guthrie, O. T.—Adelbert Hughes of Guthrie and others are incorporators of the Fort Smith & Western Railway Co., chartered to build a railroad from Fort Smith, Ark., to Guthrie, 350 miles.

Guthrie, Okla.—The Denver, Kansas & Atlantic Railroad Co. has been chartered, with a capital stock of $15,000,000, to construct 1426 miles of road from Denver through Oklahoma and Indian Territory and Paris, Texas, into Arkansas, one branch reaching Fort Smith and the other Texarkana. Smith H. Mallory of Charlton, Iowa, is named as one of the incorporators.

Hattiesburg, Miss.—It is reported that work is to be pushed on the extension of the Pearl & Leaf Rivers Railroad on the section extending thirty miles beyond Pearl River.

Houston, Texas.—Mr. C. C. Waller of Houston is quoted as stating that work upon the Fort Worth, Corsicana & Sabine Pass Railroad, which is to pass through Beaumont, will begin within the next sixty days.

Jackson, Miss.—The Alabama & Mississippi Railroad Co. has been incorporated by N. H. Rhett and others to build a railroad Y-shaped with termini at Vinegar Bend, Ala., and Napoleon and Ellisville, Miss.

Kennett, Mo.—The Malden, Kennett & Southeastern Railroad Co. has been incorporated, with a capital stock of $230,000, by R. H. Jones and others to build a road twenty-three miles in length.

Laurel, Md.—Right of way has been granted the Berwyn & Laurel Electric Railway. It is understood that this road, when constructed, will give direct trolley connection between Laurel and Washington, D. C.

Louisa, Ky.—The engineering corps of the Norfolk & Western Railway is pushing the survey for a proposed line down the Tug river, and it is reported that grading will begin as soon as the weather will permit.

Marion, Va.—Representatives of New York capitalists are expected shortly to report upon the mineral prospects of the Rye Valley section, and the character of their report is likely to determine whether the Marion & Rye Valley Railroad is to be completed

Morgantown, W. Va.—It is reported that James M. Guffey of Pittsburg will build the Cheat River Railroad from Point Marion, ten miles north of Morgantown, into Randolph county, for the purpose of developing his coal interests.

Navasota, Texas.—It is expected that work will shortly begin upon the branch of the Houston & Texas Central Railroad between Navasota and Madisonville. Mr. J. M. Lee of Houston is superintendent.

Oklahoma City, Okla.—Most of the bonus of $50,000 to be used in purchasing terminal grounds and the right of way for the Missouri, Kansas & Texas Railway, which will be built to Oklahoma City from Stevens, Kan., has been raised.

Satillo, Tenn.—Col. N. N. Ensley of Indianapolis is interested in the project for building an electric car line from Satillo through Jackson, Tenn., to the Shiloh battlefield, and thence to Corinth, Miss., a distance of ninety miles.

South McAlester, I. T.—The Indian Territory Traction Co. has secured permission for a survey for an electric railway more than forty miles long, connecting South McAlester with McAlester, Krebs, Alderson, Cherryville, Hartshorne, Haileyville.

St. Louis, Mo.—The St. Louis Terminal Railway Co. has been given a franchise to build a belt railroad around the city. It is announced that work will begin on June 10. The road will cost $2,000,000.

Tuscaloosa, Ala.—Right of way through the city has been granted the proposed Mobile & West Alabama Railroad. President J. H. Austill of Mobile is quoted as expecting to begin construction within a year.

Waco, Texas.—It is announced that the Texas Central Railroad will build from Ross into Waco, a distance of ten miles.

Wallisville, Texas.—The C. R. Cummings Company proposes, under certain conditions, to extend its standard-gauge log railroad, now nine miles long, a few miles eastward to connect with the Trinity river barge line.

Warrensburg, Mo.—Surveyors in charge of R. H. Jones have commenced work in locating routes for the St. Louis, Kansas City & Colorado Railroad from Warrensburg.

Street Railways.

Johnson City, Tenn.—The Johnson City Traction Co. has applied for a street-car franchise.

Machinery, Proposals and Supplies Wanted.

Manufacturers and others in need of machinery of any kind are requested to consult our advertising columns, and if they cannot find just what they wish, if they will send us particulars as to the kind of machinery needed we will make their wants known free of cost, and in this way secure the attention of machinery manufacturers throughout the country. The MANUFACTURERS' RECORD has received during the week the following particulars as to machinery that is wanted.

Automobiles.—See "Motor Vehicles."

Belting, Pulleys, etc.—See "Woodworking Machinery."

Boiler and Engine.—See "Grinding Equipment."

Boiler and Engine.—See "Mining Equipment."

Boiler and Engine.—See "Woodworking Machinery."

Boiler and Engine.—Hill & Morgan, Manufacturers' Record Building, Baltimore, Md., want eight-horse-power engine, second-hand, on wheels.

Brick Machinery.—See "Grinding Machinery."

Broom Machinery.—Southern Handle Manufacturing Co., Burlington, N. C., wants broom machinery.

Cannery.—Hill & Morgan, Manufacturers' Record Building, Baltimore, Md., want to buy second-hand canning outfit, 1000 to 2000 cans daily capacity.

Cannery Supplies.—John H. Tomlinson, Salisbury, Md., will need supplies for cannery, including capping, etc.

Chair Machinery.—See "Woodworking Machinery."

Clayworking Machinery.—M. Holt, Troy, Ala., wants to purchase machinery for pulverizing, screening and mixing kaolin into commercial paint.

Cold-storage Equipment.—John J. Rea, Clarington, Ohio, is in the market for some plan of cooling cold-storage room.

Compress.—See "Engine, etc."

Cotton Machinery.—J. Havens, Washington, N. C., wants to correspond with makers of cotton-batting and comfort machinery.

Creamery.—South Branch Cheese Co., Lentz, Mich., is in want of machinery for making cheese, including boilers, presses, vats, etc.

Crushing Equipment.—Rogers Creek Mining Co., Winston-Salem, N. C., wants mill for grinding laminated pyrophyllite, talc or white soapstone; must grind as it comes from crusher 1500 to 2000 pounds per hour fine enough to go through bolting cloth with 200 meshes to the inch. (Company states attrition mills will not do satisfactory work.)

Dredging, etc.—Sealed proposals will be received until March 17 at United States Engineer Office, Witherspoon Building, Philadelphia, Pa., for dredging and jetty construction upon route of inland waterway from Chincoteague bay, Virginia, to Delaware bay, Delaware; information furnished on application; Jared A. Smith, colonel, engineers.

Drug Specialties.—Union Wholesale Drug Co., Union, S. C., is in the market for general wholesale drug-business supplies.

Electrical Machinery.—Journal Publishing Co., Rock Hill, S. C., wants a one to two horse-power induction motor, wound for sixty cycles, 104 volts, alternating three or single phase.

Electrical Machinery.—Carlyle & Co., Louisburg, N. C., want to purchase half-dozen either dry or liquid battery motor fans, from twelve to sixteen inches in diameter.

Electrical-power Plant.—Shawnee (O. T.) Electric Light & Power Co. wants to correspond relative to electrical-power plant for cotton mill of 3000 to 5000 spindles; is desirous of knowing best system, whether motors direct to machines operated or driven by line shaft.

Electric-light Plant.—See "Water-works."

Electric-light Plant.—Bentonville, Ark., will furnish plans and specifications to parties wishing to bid on construction of electric-light plant or machinery. Address W. T. Rowland.

Engine.—Capelsie Cotton Mills, Troy, N. C., is in market for 125 to 150-horse-power second-hand engine, Corliss pattern.

Engine, etc.—John Davis, 79 Haverhill street, Boston, Mass., wants 750-horse-power steam engine set, S. H. lumber planer fourteen to eighteen inches thick, twenty feet wide, four sides; six to eight-inch steam whistle, shaving compress (Dedrick preferred), exhaust header, seven-inch pipe.

Engines.—John J. Rea, Clarington, Ohio, is in the market for one or two gasoline engines.

Exhaust Header.—See "Engine, etc."

Fire-department Equipment.—La Follette, Tenn., wants specifications on a chemical fire extinguisher. Address "The Mayor."

Flour Mills.—J. H. Davis & Son, Pelham, N. C., want to buy complete equipment for 100 barrel and 50-barrel roller flour mills.

Gas Plants.—K. B. Harvey, Punta Gorda, Fla., wants to correspond with manufacturers of acetylene-gas plants.

Ginnery.—Hugo (I. T.) Cotton Oil & Gin Co., J. W. Parsons, secretary, Ladonia, Texas, will within sixty days contract for a 60-ton cottonseed-oil mill and 100-bale ginnery.

Glass-novelty Manufacturers.—Block Coal & Coke Co., Block, Tenn., wants to correspond with glass manufacturers relative to having paper weights manufactured.

Grinding Equipment.—Norman G. Smith, Conowingo, Md., will probably be in the market for cylinder grinders, boiler and engine.

Grinding Machine.—Monarch Roofing & Covering Co., 519 West Twenty-first street,

New York, N. Y., wants to buy grinding machine to grind clay.

Grist Mill.—Stone Mountain Milling Co., Stone Mountain, Ga., wants to correspond with manufacturers of grist-mill machinery.

Handle-polishing Machinery. — Southern Handle Manufacturing Co., Burlington, N. C., wants a handle-polishing machine.

Hoisting Equipment.—See "Mining Equipment."

Malleable-iron Workers.—Southern Singletree Co., Chattanooga, Tenn., wants addresses of malleable-iron plants; also desires correspondence relative to having made its singletree clips of steel.

Mining Equipment.—Cullowhee Copper Co., Thomas A. Cox, secretary, Cullowhee, N. C., is in the market for 60-inch by 16-foot boiler, steam hoisting engine, sinking pump, air compressor, air drill, etc.

Mining Slope Work.—Alabama Consolidated Coal & Iron Co. will receive bids at Brookwood, Ala., for sinking two rock slopes, one 233 feet long, more or less, and the other 145 feet, more or less. Specifications and plans may be had on application at engineer's office, Brookwood. Usual rights reserved.

Motor Vehicles. — Willard Smoot, 10-11 Chamber of Commerce, Richmond, Va., wants a list of motor vehicles using other than electric power.

Oil Mill.—See "Ginnery."

Paint Machinery.—See "Clayworking Machinery."

Paper-folding Machine.—McKinney Printing Co., McKinney, Texas, is in the market for a newspaper folding machine.

Paper Pipe.—R. H. Russell, San Antonio, Texas, wants addresses of firms manufacturing bituminized paper pipe.

Piling System.—Hill-O'Meara Construction Co., St. Louis, Mo., will probably want correspondence relative to construction of a system of piling.

Railway Equipment.—McClure & Grenamyer, Dyas, Ala., will be in need of a standard-gauge logging locomotive of from twenty to twenty-five tons weight, with low driver.

Railway Equipment.—Wm. Minnigerode, Lynchburg, Va., wants second-hand iron standard-gauge turntable, not less than fifty feet long, with minimum capacity of seventy-five tons.

Railway Equipment.—Edgar S. Low, Empire Building, Pittsburg, Pa., is in the market for one 36-inch-gauge saddle-tank locomotive, 36-inch-gauge 20 to 25-ton mogul locomotive, twelve 42-inch-gauge logging cars, one 42-inch-gauge passenger coach and one 42-inch-gauge combination car.

Rice-mill Machinery.—Roanoke Rice Milling & Cereal Co., J. M. Booze, vice-president, Roanoke, La., will be in the market for complete rice mill.

Road Machinery.—C. Markley, Roanoke, Va., is in the market for a second-hand steam road roller (ten tons).

Safe.—Lock Box No. 300, Thomasville, N. C., wants safe with burglar-proof chest; second-hand preferred.

Sawing and Polishing Equipment.—L. E. Marion, Box 268, New Iberia, La., wants to correspond with manufacturers of quarrying machinery, including sawing and polishing equipment.

Shoemaking Machinery.—J. Acuna Gonzalez & Bro., Foluca, Mexico, want to correspond with manufacturers of shoemaking machinery.

Shuttle-blocks.—W. N. Wright & Co., 28 Porter Building, Memphis, Tenn., want addresses of manufacturers making shuttle-blocks in the rough.

Silk Mill.—H. J. Cordle, Littleton, N. C., wants to correspond with makers of silk-mill machinery.

Smelting Equipment.—Ball Mountain Copper Co., D. T. Kirkpatrick, manager, Frank, Ark., wants copper and lead smelting machinery.

Steam Whistle.—See "Engine, etc."

Steelworkers.—See "Malleable-iron Workers."

Tankage, etc.—Union Oil Co., L. F. Fox, general manager, Galveston, Texas, will later on need tankage, machinery, etc.

Water-works.—A. R. James, city clerk, Marshall, Mo., will open bids March 3 for construction of water-works and electric-light plant. Work consists of ten miles of cast-iron water main, necessary valves and hydrants, power-house, necessary machinery and two storage reservoirs. Deposit of $7000 required. Plans and specifications at city clerk's office and office of R. H. Phillips, 720 Lincoln Trust Building, St. Louis.

Water-works Materials.—City wants estimates on $375,000 worth of material and pipe laying; bids to be opened February 28; will have about $125,000 worth more of the same class of work about a month later. Address Ben C. Adkins, city engineer, St. Louis, Mo.

Well-drilling.—Proposals will be opened March 5 at office depot quartermaster, Room 807, Equitable Building, Baltimore, Md., for furnishing all machinery, material and labor required for sinking one six-inch tubular deep well at Fort Smallwood, Md. Usual rights reserved. Circular to bidders and information furnished on application to T. B. Lamoreux, captain of artillery, quartermaster.

Well-drilling Equipment. — John G. McGuire, McMinnville, Tenn., wants addresses of parties or firms dealing in machinery suitable for boring wells.

Wireworking Machinery.—Frank Wright, Cave Spring, Ga., wants to correspond with manufacturers of machinery for making fly-screens for doors, windows, etc.

Woodworking Machinery.—See "Engine, etc."

Woodworking Machinery.—Elk Furniture Co., D. F. Conrad, secretary-treasurer, Lexington, N. C., wants to purchase full equipment for manufacture of furniture; will install double set of machines.

Woodworking Machinery.—Houston Showcase & Manufacturing Co., J. S. Purdy, secretary, Houston, Texas, is in the market for 60-horse-power engine, 50-horse-power boiler and 10-inch or 12-inch four-side molder.

Woodworking Machinery.—Reeves & Morgan, Dothan, Ala., are in the market for two flooring machines, double surfacer, weighing 8000 or 10,000 pounds each; one timber machine to dress 12x18-inch stuff, resaw, molding machine, rift flooring machine, 100-horse-power boiler and 50-horse-power engine, belting, pulleys, shafting, hangers, etc.

Woodworking Machinery.—Warrenton Furniture Co., Warrenton, N. C., wants second-hand seat-frame machine, double-spindle shaper (heavy), chair-back tenoner, routing and grooving machine, press for pressing cane in seats, back-post bending machine (complete), double or triple drum sander, back press, seat press and back gaining machine.

Woodworking Machinery.—L. Hale, Davenport, Va., is in the market for a planing machine.

Woodworking Machinery.—L. W. Shelhorse, Winston, Va., desires to purchase a cement and lime barrel stave plant.

Woodworking Machinery.—J. Frank Greene, Box 150, Greensboro, N. C., desires catalogues and prices on woodworking machinery, including lathe for oval and round tool handles, machines for sawing and planing hard and soft wood blocks two inches square and up and three to twenty-four inches long, to smaller sizes.

TRADE NOTES.

Ball Engines Used.—Ball Engine Co., Erie, Pa., is building for the Mt. Vernon Shops, Baltimore, of the Pennsylvania Railroad, a 200-horse-power tandem compound engine arranged for direct connection to a Westinghouse alternator. The engine is provided with synchronizing device, as it will run in parallel with another engine.

To All Parts of the World.—The merits of the Cross oil filter and the exhaust heads made by the Burt Manufacturing Co. of Akron, Ohio, make buyers for them in all parts of the world. Recent foreign shipments by the company included orders received from Brazil, Finland, England and Austria. Six large oil filters went to Finland.

Vulcanite Portland Cement Co.—This Philadelphia manufacturer has established an office in New York city, with Albert Moyer in charge and Walter F. Vernon as sales agent. It also has an office in Chicago, in charge of Geo. W. De Smet. The company will thus be enabled to handle to advantage the trade of users of its cement in the sections covered by these offices. Its No. 3 mill at Vulcanite, N. J., will be in operation by May 1 with capacity daily of 4000 barrels.

A Bronze Tablet.—A recent product of the plant of J. J. Ryan & Co., brass founders and finishers, was a bronze tablet, in size 2 feet 6 inches by 3 feet six inches. It was installed in the vestibule of a leading church at Springfield, Ill., and the architect pronounced it satisfactory in every detail. The firm secured this contract not only on account of the fine character of the work it produces, but also because it was the only plant guaranteeing delivery in two weeks' time.

Fay & Egan Branch at Buffalo.—A branch office of the J. A. Fay & Egan Co. of Cincinnati has been established at Buffalo, N. Y. The quarters occupied are at 69 Chapin Block, in charge of B. E. Crafts. Mr. Crafts has heretofore represented the company as salesman in the territory tributary to Buffalo, but the continually increasing business necessitates a branch office. The standard woodworking machinery of the J. A. Fay & Egan Co. will thus continue to be brought to the attention of woodworkers in that section.

Electrical Specialties.—John T. Morris & Co. have equipped a factory at No. 212 N. Holliday street, Baltimore, for the manufacture of electrical specialties. The machinery is entirely new and of the latest pattern. The electricians employed are specialists. The company will manufacture switchboards for electric lighting and power and telegraph and telephone appliances, besides doing repair work on police and fire-alarm systems, searchlights, dynamos, motors and ship instruments. Special attention will be given to the development of the ideas of inventors. A feature of the company's work will be interior telephony.

New South Brick Machinery.—Messrs. J. C. Steele & Sons, manufacturers of "New South" brickmaking machinery, Statesville, N. C., are receiving orders every day, coming from all sections of the South. From present indications they expect this year's business to be the largest they have ever done. The firm recently placed outfits in Bristol, Tenn.; Pollard, Ala.; Blakeley, Ga., and are shipping outfits to Starrsville, Ga.; Athens, Ga.; Conway, S. C., and automatic cutters to Lake Charles, La.; Concord, N. C.; Rock Hill, S. C., and Lake City, Fla.; also recently shipped a carload of double-deck dryer cars to Castleberry, Ala.

Standard Pneumatic Tools in Canada.—Standard Pneumatic Tool Co., Aurora, Ill., has established an office and depot at Toronto, Canada, for the sale of its Little Giant pneumatic tools and appliances, repair parts and accessories. In future all machines and repairs for Canadian customers can be procured from that branch, thus avoiding the inconvenience of manifests, duty and custom-house detail. The company's business in Canada is growing rapidly. J. B. Wilson (formerly of the Grand Trunk Railway's mechanical department) will have charge of the Toronto offices at 103 Union Station Arcade.

H. W. Caldwell & Son Co.—This Chicago company is one of the representative manufacturers and installers of elevating, conveying and power-transmitting machinery, as is well known to thousands of manufacturers and power-users, and its success in its chosen field has been extensive. A sales and engineering office has just been established in New York city at 95 Liberty street, Room 410, and R. T. Pearce, mechanical engineer, will be in charge to give his personal attention to the Eastern trade. The Caldwell Company's acquaintance with its chosen field will enable it and its representative to render efficient engineering assistance to anyone interested in its line of machinery.

Letter from Loomis & Nyman.—A letter from the well-known firm of Loomis & Nyman, Tiffin, Ohio, says: "Never before in our thirty-five years' experience as manufacturers of machinery and tools for well-drilling and prospecting have we been as busy as we are now, and never were we so well prepared to furnish our customers with the latest and best improvements. Our improved machines for drilling oil and water wells are fast supplanting many of the devices that have been used for that purpose. Since the first of the year we have filled many orders which have come to us from different parts of the country from New Jersey to Arizona. When the Southern States become better acquainted with modern machinery for well-drilling we look for a very large trade from that section of the country."

Ten Towing Machines.—The meritable qualities of the Shaw & Spiegle automatic steam towing machine continually give the manufacturer contracts from leading shipbuilders and shipowners. As an instance of this fact the following may be mentioned: From February 1 to 15 the American Ship Windlass Co. of Providence, R. I. (which makes the machines named), filed orders for ten machines from the following: Buffalo (N. Y.) Dry-Dock Co., New York Shipbuilding Co., South Camden, N. J.; Oregon Railway & Navigation Co., Portland; Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia; Wm. R. Trigg Company, Richmond, Va.; Townsend & Downey Shipbuilding & Repair Co., Shooters Island, N. Y.; Burlee Dry-Dock Co., Port Richmond, N. Y.; Arthur Sewall & Co., Bath, Me., and Puget Sound Tugboat Co., Seattle.

For Cotton Mills.—A useful article to have handy in a cotton mill is a material for stopping leaks in pipe joints and around chimneys, cornices, gutters and large leaks in roofs. A cement offered for piping that is already largely used is the Callahan old reliable steam pipe joint cement. It immediately stops the class of leaks referred to, it matters not what liquid the pipes are carrying. This cement is sold as a dry powder, and is made ready for application by simply mixing with pure boiled linseed oil to a putty. It sets rapidly, and can be easily separated without injury to threads or flanges, and it will withstand any pressure. For roof leaks and their accompanying leaks is offered Callahan rubber roof cement, which also acts effectually immediately on application. Both of these specialties have been on the market fifteen years, and among the prominent users may be named the United States government. Messrs. Geo. Callahan & Co., the manufacturers, have their offices at 218 Front street, New York, and will furnish information to inquirers.

Crocker-Wheeler Electrical Equipment.—Announcements are continually being made of large established manufacturing plants installing electrical equipment for power to replace other classes of power machinery. The Jos. Dixon Crucible Co. of Jersey City is one of these plants. It formerly operated four separate steam plants, but now has combined them into one electric-power plant, a 100-kilowatt generator and twenty-four motors being already in position (all of Crocker-Wheeler manufacture), with more to follow. The Crocker-Wheeler Company of Ampere, N. J., manufacturer and electrical engineer, equipped that plant, and is continually filling orders from other prominent establishments for similar equipments. Its January shipments comprised generators ranging in size from 30 to 520 kilowatts, and motors from 10 to 130 horse-power. Among the companies ordering these was the National Tube Co. of Pittsburg, Pa.; American Car & Foundry Co. of Madison, Ill.; Armour Fertilizer Works, Atlanta; Park Steel Co., Pittsburg, Pa.; Niles Tool Works, Hamilton, Ohio, and other prominent concerns. The fact that such leading companies ordered from the Crocker-Wheeler Company was significant.

New Air-Compressor Works.—As the use of compressed-air machinery increases, and it is doing this rapidly in all avenues of industrial activity, the demand for air compressors naturally also increases. Simplicity in design, durability and economy in power consumption and general efficiency are the great requirements in an air compressor. Of such a type will be the line of compressors to be made and sold by the American Air Compressor Works, recently organized, with offices at 26 Cortlandt street, New York city. The leaders in this organization are parties formerly connected with the Clayton Air Compressor Works. Fredk. B. Vail (formerly manager of Clayton office) will be in charge of the sales department; William S. Fairhurst (late manager of Clayton works) will manage the manufacturing, and John J. Riley (who has been employed and established for forty years at Van Brunt and Summit streets, Brooklyn, N. Y.) will be treasurer; the works are at Mr. Riley's plant in Brooklyn. The American Air Compressor Works will be prepared to supply at reasonable rates any repairs for Clayton machines, and its new machines will embody the satisfying merits of those machines, as well as new and important improvements. Buyers of air and gas compressors, carbonic-acid gas machines, air receivers, vacuum and tar pumps, etc., are invited to obtain specifications and prices from this new company before placing their orders.

Some Machinery Exhibits at the Charleston Exposition.

Among the many attractions at the South Carolina, Interstate and West Indian Exposition the exhibits in Machinery Hall should be of great interest to all visitors, particularly to the people of the South, where the demand for machinery and its necessary supplies is ever increasing.

With regard to this department of the exposition, it was the aim of exhibitors to make as varied and complete a display as possible, in order to have something of interest to all classes of trade. In order to give an idea of the extent of the display, a list is given below, showing an exhibit covering 5000 square feet of floor space, made by the Bailey-Lebby Company of Charleston:

Asbestos Goods.—H. F. Watson Manufacturing Co.'s asbestos pipe and boiler coverings, asbestos packings, gaskets, etc.

Abrasive Material.—The Carborundum Company's "Pan-American" exhibit, showing carborundum wheels, stones, etc., from the crude crystal to the finished product; specimens of work done by carborundum.

Air Compressors.—"Marsh" 14x10x12 air compressors.

Air and Electric Drills.—Jeffrey Manufac-

turing Co.'s coal drill, operated by air or electricity.

Belting.—A handsome display of Peerless Rubber Manufacturing Co.'s products, showing its "Rainbow," "Peerless," "Eclipse" and "Germane" packings, Durham and Fortune belt and other lines manufactured by it, such as rubber mats, hose, tubing, valves, etc.; Revere Rubber Co.'s "Giant" seamless and stitched rubber belt, from seventy-two inches to six inches; underwriters' and mill hose, water, steam and suction hose, "Black Hawk," "Usudurian," "Red Crescent" packings; the Gandy Belting Co.'s "Original Gandy Belt" in various widths and plys; Jewell Belting Co.'s pure oak-tanned leather belt, in singles and doubles, manufactured for the Bailey-Lebby Company under its brands "Magnolia" and "Star;" the Bailey-Lebby Company's celebrated "Crescent" plain and stitched rubber belt and "Palmetto" rubber belt.

Belt-Lacing Machine.—The Jackson belt lacer, for lacing leather, rubber or canvas belt; shown in operation.

Boilers.—The "Fitzgibbon" patent boilers, in use by the Exposition Company, operating a 12x12 vertical engine direct-connected to an 18-inch centrifugal pump, for pumping water to Lake Juanita; an Ames Iron Works 30-horse-power horizontal return tubular portable boiler in operation by Exposition Company.

Brass Goods.—Wm. Powell Company's lubricators, oil and grease cups, regrinding valves, whistles and engine trimmings.

Blocks.—Yale & Towne Manufacturing Co.'s chain blocks and hoists, differential, duplex and triplex.

Drills.—A display case showing Standard Tool Co.'s twist drills, reamers, sockets, taps, milling cutters and chucks.

Drill Presses.—Cincinnati Machine Tool Co.'s upright power drills, with positive reversing clutch, shown in operation; W. F. & John Barnes' square base upright power drills, shown in operation.

Drill Grinders.—New "Yankee" drill grinders, motor driven, belt driven, and bench grinders, shown in operation.

Elevating and Conveying Machinery.—Jeffrey Manufacturing Co.'s complete exhibit from Paris Exposition, consisting of spiral conveyors, link belting, sprockets, elevating chain, buckets and gearing; the "Century" conveyor; "Columbian" separator; air and electric mining drills.

Engines.—Ames Iron Works' Vim 20-horse-power center-crank engine, shown in operation; the "Ericsson" improved hot-air pumping engine, fitted to burn gasoline, shown in operation; the improved "Rider" hot-air engine, fitted for burning coal. Gasoline—A group of "Superior" gasoline marine engines, one-half, three and eight horse-power; Fairbanks, Morse & Co.'s gasoline engines, twelve and five horse-power, shown in operation, and "Jack of all Trades" gasoline engine, for farm and shop use; the "Howard" three-and-one-half-horse-power gasoline marine motor; the Sintz Gas Engine Co.'s 12-horse-power marine gasoline engine; a group of "Globe" marine motors, three, six and thirty-five horse-power—the six horse-power is shown in operation.

Fans.—Grant-Ferris rice and grain cleaning fans.

Gins.—Brown Cotton Gin Co.'s improved gins and linters; Dobson & Barlow long-staple roller cotton gin.

Gear Cutters.—D. E. Whiton power-feed gear-cutting machine.

Governors.—The Gardner Governor Co.'s pump and engine governors.

Hose Reels.—Wirt & Knox all-steel warehouse and wall reels, hose carts and racks; this make of hose cart in use by Exposition Company.

Hoisting Engines.—Double-cylinder, double-drum "Mundy" hoisting engine, complete with boiler, in operation.

Injectors.—A display rack showing all sizes of Metropolitan single and double tube injectors and ejectors; an exhibit of United States injectors of all sizes; a pyramid of Hancock inspirators, from largest to smallest.

Keyseaters.—The Burr portable shaft keyseater on stand.

Kerosene Engines.—A two-horse-power "Mietz" kerosene engine in operation.

Lathes.—Hendey patent screw-cutting engine lathe, with improved system of mounted change gearing (in operation); Rahn-Mayer carpenter lathes; one 16-inch by 6-foot engine lathe, turret on carriage; one 18-inch by 6-foot engine lathe with compound rest, turret or shears; one 18-inch by 6-foot engine lathe, compound rest; one 18-inch by 6-foot gap lathe; W. F. & John Barnes' No. 13 screw-cutting lathe, with automatic cross-feed, compound rest and tricycle attachment, in operation.

Leather.—A display of English walrus leather, imported by the Bailey-Lebby Company for covering rollers on long-staple cotton gins.

Milling Machines.—The Oesterlein 24-inch "Universal" milling machine, shown in operation.

Mills.—The Kelly duplex feed mill, for grinding ear corn with the shuck on, cotton-seed, oats and other grain; a display of Nordyke & Marmon flouring-mill machinery, consisting of its 18-inch plantation mill, 22-inch "Dixie" pulley mill, 24-inch "Nordyke" under-runner pulley mill; the De Loach Mill Manufacturing Co.'s variable friction feed saw-mill complete; the "Queen of the Forest" and "Kentucky" shingle machines; the "Paragon" improved variable friction feed planer, and the improved De Loach 20-inch under-runner corn mill.

Mechanical Tools.—L. S. Starrett's calipers, dividers, gauges, rules, levels, squares and machinists' fine tools.

Oilers.—Copperized and nickeled oilers and oiler sets.

Packing.—A large display of Daniels' P. P. P. regular and special packing; "Uncle Sam" flax packing; "Eureka" "Empire" and "Ebony" gum packing; Garlock's spiral packing; an extensive exhibit of "Rainbow" and "Peerless" packing and "Eclipse" gasket.

Pumps.—Goulds Manufacturing Co.'s hand and ship pumps, hydraulic rams and triplex electric pump, shown in operation; a display of Marsh steam pumps, consisting of one 3x 1¾"x2½ boiler feed, one 6x3⅝x8 regular service, one combined automatic pump in operation, one 10x16x9¼"x16 compound, one 14x10x 12 air compressor; Snow Steam Pump Co.'s duplex boiler-feed pumps, 3x2x3, 4½x2¾x4 and 6x4x6; No. 4 improved pattern pulsometers, with pump stand; 18-inch centrifugal pump, direct-connected to 12x12 vertical engine.

Pulleys.—A display of the "Reeves" wood-split pulleys shown in motion; a display of "Oneida" all-steel pulleys.

Planers.—Mark Flather 22"x22"x5' standard planer complete in operation.

Pipe Machines.—Curtis & Curtis patent die stocks and pipe machines in operation; Armstrong No. 0 and 00 pipe machines, stocks and dies, and pipe-cutters.

Plumbing Material.—A model bathroom, with "McShane" modern baths, lavatories, etc.

Plumbers' Brasswork.—A display of H. Mueller Manufacturing Co.'s corporation cocks, tools and high-grade brass goods, pressure regulators and plumbers' tools; machines for tapping water and gas mains.

Regulators, Pressure.—Watson & McDaniel reducing valves, pressure regulators, steam traps and exhaust heads.

Roofing.—A shed covered with "Flintkote" roofing, with display of rolls of various plys; "Palmetto" two and three-ply ready roofing.

Rice Drills.—"Kentucky" steel and wood frame improved rice and grain drills.

Rice Threshers.—42x64 "Columbia" rice thresher, complete with conveyor.

Rice Hullers.—The Engelberg rice huller and polisher, rice grader and food mill.

Rice Separator.—"Monitor" No. 6 separator, with brush attachment.

Saws.—The celebrated "Simonds" band and circular saws, planer knives and hand saws.

Shapers.—Flather 18-inch adjustable crank shaper, shown in operation.

Shoe Pads.—A display of rubber horseshoe pads made by Revere Rubber Co.

Tools.—Wells Bros.' "Little Giant" taps and dies and screw-cutting tools; Hart Manufacturing Co.'s "duplex" pipe and bolt stocks and dies; power hack saw for machine-shop work.

Tapping Machines.—"Mueller," "Premier" and "Columbia" tapping machines.

Valves.—A display of a complete line of brass and iron valves, engine trimmings, brass goods and fittings; the Bashlin removable disc valve.

Wrenches.—J. H. Williams & Co.'s chain tongs, engineers' wrenches, drop forgings, lathe dogs and special forgings.

Windmills.—Stover Manufacturing Co.'s "Ideal" steel windmill, with galvanized tower.

Wire Rope.—Trenton Iron Co.'s galvanized and steel wire rope, wire and finished products.

Water-Wheels.—One De Loach 15-inch No. 2 water-wheel and 24-inch register gate water-wheel.

TRADE LITERATURE.

Lacing a Belt.—This valuable booklet contains information that no belt-user should be ignorant of, especially as it is only necessary to inscribe a few lines on a postal to secure the publication. Briefly, Messrs. I. B. Williams & Sons, Dover, N. H., have therein presented a simple and practical method of lacing belts, also a few hints and handy belt rules. "When you think of belts, think of Williams," and do not fail to ask for one of the booklets. Williams belting is known everywhere.

Electro-Dental Specialties.—There is scarcely an avenue of active life but that electricity enters into its conduct. Dentists have adopted electrical energy for their uses during recent years, and successful equipments especially designed and constructed for them find ready markets. The Victor Electric Co., 55 Market street, Chicago, is giving attention to this demand, and its electro-dental specialties are illustrated and described in leaflets now ready for distribution. Interested users or dealers are invited to correspond.

Wagon and Stock Scales.—Scales for wagon and stock use, as well as for other purposes, must be absolutely accurate, durable and reliable generally in order to give their owners entire satisfaction. The manufacture of scales of the highest class requires care and attention to detail, as well as the possession of modern manufacturing equipments. Messrs. McDonald Bros. of Pleasant Hill, Mo., are presenting to the buying public scales of the class referred to. Their catalogue No. 11 tells about these scales. Write for one.

Wonderful Cold-Water Paint.—"Aquamarine" is a cold-water paint produced in dry powder form. Its manufacturers refer to it as a wonderful cold-water paint, and the extensive use it has attained bears out the claim. In a neat booklet Messrs. Muzzy Bros., the manufacturers in question, tell briefly what their paint accomplishes. The booklet also is exceedingly handy for a vest-pocket memorandum. It contains useful information for general use aside from the facts relative to "Aquamarine." Address the firm at 189 Main street, Paterson, N. J.

An Artistic Leaflet.—Thus may be characterized the leaflet now being distributed by the Eastern Granite Roofing Co., Gerken Building, New York city. It presents two pictures reproduced from paintings by Louis Edouard Fournier, the subject being "Washington and His Mother." George Washington, the highest type of American citizen, accordingly assists in impressing upon a reader of the leaflet that "Perfected Granite Roofing" is the highest type of ready-gravelled roofing. It is claimed to be the original stone-surfaced roofing, in use for over eighteen years. Write for photo pamphlet.

The Latchstring Is Out.—With this title the Morris Sherman Manufacturing Co., Chattanooga, Tenn., issues an advertising novelty calling attention to its line of boilers, condensers, heaters, hot wells, etc. The boilers include marine water-tube, marine pipe, Scotch marine, Clyde marine and other types for various classes of vessels; also vertical and horizontal water-tube boilers, tank towers, standpipes, etc.; in fact, the company's output is that of a complete modern boiler manufactory and metal-working plant. Send for particulars if you are a present or prospective user.

What Southern Mills Say.—"Southern Mills and What Their Owners Say" is an interesting booklet to millers of flour and other grains. Progressive millers who are desirous of becoming acquainted with the good words said for machinery used in their department of manufacture should not fail to send for copy of the booklet. Some of the most prominent, as well as the more modest of the flour mills in the South use the modern machinery offered by Messrs. Sprout, Waldron & Co. of Muncy, Pa., and it is the machinery of this firm that is spoken of in the testimonial letters of which the booklet mentioned is composed.

Protective Devices.—This is the title of a new S. K. C. System Bulletin, No. 124. This bulletin describes the S. K. C. switchboard and pole-line fusible cut-outs, including the 30,000-volt "ball fuse" and the type "F" high-capacity fuse. A combined oil-switch and circuit-breaker switch, the circuit-breaker of the slide type, each break of which is provided with an arc-rupturing shutter, are also illustrated and described. The S. K. C. secondary protector, lightning arrester, ground detectors, etc., are other subjects of this publication. The bulletin is perfectly printed, beautifully illustrated, and is a comprehensive treatise of the subject covered. It is published by the Stanley Electric Manufacturing Co. of Pittsfield, Mass., and will be sent to those interested upon request.

Star Whitewash and Painting Machines.—The use of spraying machines for whitewash, paints and other materials for coating walls, metals, fences and numerous other places is on the rapid increase. The advent of these machines was a boon to contractors, consumers and others making use of coating liquids, and the demand has consequently been created all over the country. The Star spraying machine is one of the most prominent makes in apparatus of the character mentioned, and its maker, the Star Brass Works, of 67 Canal street, Chicago, Ill., issues a complete descriptive catalogue. This company's booklet should not fail of perusal by the class of coating material consumers indicated.

Niagara Hydraulic Engine.—This machine is a modern development of the old-fashioned hydraulic ram. It represents the latest adaptation of the principles of hydraulics, and is capable of being utilized for a number of purposes. In size the Niagara hydraulic engine ranges from the little household supply machine to the powerful engine with a capacity sufficient to supply a town with water or irrigate a tract of land, make meadows where barren wastes existed, or serve the requirements of railway tanks and large manufacturing establishments. A complete illustrated catalogue of the Niagara has been issued by its constructor, the Niagara Hydraulic Engine Co., of Chester, Pa., and copies are obtainable on request. Operators making use or likely to make use of the possibilities of the machine in question should not fail to examine the catalogue before signing their contracts for machinery of this class.

Ransome's Patent Concrete Mixers.—One of the most important classes of equipment required in construction work wherever cement is used is the mixing machine. In order to mix concrete successfully, and to the entire satisfaction of the contractor, modern forms of machines are necessary. Inventors have given attention to these requirements, and the introduction of the Ransome patent concrete mixer gave to users a mixer that embodies the salient points necessary. The Ransome & Smith Co., 11 Broadway, New York, manufactures the mixer in reference, and has issued an illustrated booklet containing a complete description of same, together with a number of letters from leading users telling of the results obtained. It may be mentioned that a contract now being filled by the Ransome & Smith Co. calls for two of the largest mixers in the United States. Their capacity will be 600 cubic yards per day each. They are for the Atlantic, Gulf & Pacific Company.

Steam Hoisting Engines.—Contractors and quarrymen probably exercise no greater care in buying any class of machinery for which they have use than their steam hoisting engines and accompanying apparatus and equipment. Geared locomotives, derrick cars, derrick irons, hand-powers, blocks and sheaves are included in the equipment which the industrial workers named utilize in their operations. The John F. Byers Machine Co. of Ravenna, Ohio, has been one of the most successful designers and constructors of the machinery mentioned. Its semi-portable and entirely portable steam hoisting engines and accompanying apparatus are treated of in Catalogue G, now ready for distribution among those interested. Improved methods of manufacture with special tools and labor-saving appliances and improvements in the details of construction of the machines suggested by the company's experience enables it to offer with extraordinary quick deliveries a recognized modern high-speed hoisting engine. The correct principles of these designs have produced efficient and reliable machines of light weight, great power and wonderful durability. For full description and illustrations write for the catalogue.

Railroad Cars.—Wooden cars for railroad use in the transportation of different kinds of freight will continue to retain favor with railroad officials for many reasons. These reasons are patent to the experienced railway manager, and the demand continues to furnish contracts to the leading railroad car works of the country. Among these works is the prominent establishment conducted at Lebanon, Pa., by Messrs. M. H. Treadwell & Co. (successors to Lebanon Manufacturing Co.), and whose main offices are at 95 and 97 Liberty street, New York city. The firm's illustrated catalogue is a creditable specimen of the printer's art, and its pages tell in a brief but thorough manner of the advantages of the particular cars in reference. These cars are built in standard types, with interchangeable parts to ensure quick replacements and repair in case of damage. They comprise cattle, stock, refrigerator, hopper, coal, coke, maintenance of way, sugare-cane and tank cars of various models, as requirements dictate to the buyer and user. Specialties of Treadwell & Co. are the ballast, box, caboose with tool box, cooperage, cement, crane, cinder, charging, drift, dump, derrick, ingot casting, ingot transfer, hot metal, ladle, mine, open-hearth charging, push and rail cars. Specifications, proposals and full particulars can be obtained on application.

FINANCIAL NEWS.

The Manufacturers' Record invites information about Southern financial matters, items of news about new institutions, dividends declared, securities to be issued, openings for new banks, and general discussions of financial subjects bearing upon Southern matters.

Banking Capital Wanted.

A correspondent of the Manufacturers' Record writes that he is undertaking to organize a bank with a capital of $100,000, a large portion of which will be subscribed by local people, but some outside capital is desired. The town is said to be a rapidly-growing manufacturing center, needing banking facilities. Letters addressed to "H. S. D." will be forwarded.

New Corporations.

The Kentwood Bank of Tangipahoa, La., with a capital of $25,000, has been chartered.

The Baxley (Ga.) Banking Co., with a capital stock of $30,000, has applied for a charter.

The La Follette (Tenn.) State Bank has been incorporated, with $25,000 capital stock.

About $30,000 have already been subscribed for the organization of a new bank at Uniontown, Ala.

The Bank of Hollander, Miss., has begun business with L. C. Hayes, president, and S. W. Morris, cashier.

The Commercial State Bank of Church Point, La., has been organized, with capital stock of $15,000.

It is announced that the capital stock of the Atlantic Trust & Deposit Co. of Norfolk, Va., will be $100,000.

The capital stock of $30,000 of the new First National Bank of Middlebourne, W. Va., has been oversubscribed.

Directors have been elected for a national bank at Gulfport, Miss., which will have a capital stock of $100,000.

Messrs. J. W. Cook and others have been authorized to organize the First National Bank of Carthage, Texas.

The Mount Hope Bank of Fayette county, West Virginia, has been incorporated with a capital stock of $25,000.

Organization of the First National Bank of Lubbock, Texas, has been authorized by the comptroller of the currency.

The Plains Bank of Sumter county, Georgia, with a capital of $25,000, has been incorporated by R. S. Oliver and others.

The United Building and Savings Association of Baltimore, Md., has been incorporated, with capital stock of $520,000.

The Farmers' State Bank of East Lynne, Mo., with a capital stock of $10,000, has been incorprated by P. Spencer and others.

The Citizens' Bank of Stuttgart, Ark., with a capital stock of $25,000 and with F. E. Brain, president, has filed articles of incorporation.

The McComb (Miss.) Land & Investment Co. has been chartered by B. A. Heidenreich and others, with a capital stock of $20,000.

The First National Bank of Mt. Savage, Md., with a capital stock of $25,000, has been organized by W. Bladen Lowndes and others.

The application of P. S. Newcomb and others for the establishment of the American National Bank of South McAlester, I. T., with a capital of $50,000, has been approved.

A dispatch from Chicago says that New York and Chicago banks are interested in the establishment at New Orleans of a banking and trust company with a capital of $1,000,000.

A dispatch from Kansas City, Mo., says that ex-Gov. David R. Francis and other St. Louis capitalists are interested in the formation of a new trust company at Kansas City with a capital of $1,000,000.

New Securities.

The city council of Columbus, Miss., is advertising for bids for $98,000 worth of 5 per cent. 20-year refunding bonds.

An election will be held on March 25 to determine upon the issue by Columbus, Miss., of $50,000 worth of improvement bonds.

The commissioners' court of Colorado county, Texas, has passed an order providing for a refunding at 3 per cent. of $62,000 of 5 per cent. courthouse, jail and bridge bonds.

Commissioners of Jackson county, Alabama, have authorized the sale of $125,000 worth of pike-road bonds, completing the full amount of the issue of $250,000 authorized by the legislature.

Taxpayers of Salisbury, Md., have approved of a bill before the Maryland legislature authorizing an issue by the city of $4000 worth of 5 per cent. bonds to meet the expenses of repairing the city fire engines.

The commissioners' court of Galveston county, Texas, has declared ready the refunding bonds amounting to $275,000, of which $200,000 are to fund the county's floating indebtedness and $75,000 to refund 20-year 6 per cent. bonds.

Commissioners of Galveston county, Texas, have ordered an election for March 20 on the proposition to issue $1,500,000 worth of county bonds paying 4 per cent. interest and running forty years, to build a sea-wall around Galveston.

Sealed bids for the sale of $75,000 of 4 per cent. city school bonds of Memphis, Tenn., will be received by Secretary A. B. Hill of the board of education until March 1; $25,000 of the bonds will be paid in 1916, $25,000 in 1921 and $25,000 in 1926.

Stockholders of the New Orleans & Northeastern Railroad Co. of New Orleans will consider on March 5 the advisability of increasing the authorized capital stock of the company by $1,000,000, and of creating $8,000,000 of 4½ per cent. general mortgage bonds and $1,500,000 of 4½ per cent. income bonds to meet and retire outstanding 6 per cent. mortgage bonds, to discharge existing liabilities and for other purposes.

Financial Notes.

It is announced that the Memphis Trust Co. has increased its capital from $300,000 to $600,000.

Hamblen county, Tennessee, has voted in favor of an expenditure of $50,000 for turnpike improvement.

More than $500,000 of subscriptions to the proposed breakwater bond issue for Galveston are in sight.

The Vicksburg Bank, the largest financial institution of Vicksburg, Miss., has become the American National Bank.

Municipal officers of Alexandria, Va., are considering plans for the payment of about $30,000 of city 6 per cent. 30-year bonds, which will fall due about July 1 next.

Stockholders of the Continental National Bank of Baltimore have unanimously approved the recent purchase of that bank by the National Bank of Commerce of the same city.

The election on the proposed new bond issue at Macon, Ga., resulted in a defeat of the proposition. Of a total of 1012 registered voters, but 651 voted. To have authorized the issue would have required 675 votes in its favor.

Bids for the issue of $75,000 of 4½ per cent. 40-year general improvement bonds of Montgomery, Ala., have been received from parties in Cincinnati and Columbus, Ohio, and Montgomery, Ala.

A meeting of the stockholders of the State Bank & Trust Co. of Columbia, S. C., will be held on February 24 to consider a proposition to change the name of the company to the State Bank.

At a special meeting of the stockholders of the United States Cotton Duck Corporation the recommendation of the directors that the capitalization of the corporation be reduced from $50,000,000 to $30,000,000, equally divided into preferred and common stock, was adopted.

SOUTHERN COTTON MILL STOCKS

Quotations Furnished by Hugh MacRae & Co., Wilmington, N. C., for Week Ending February 17.

	Bid.	Asked.
Abbeville Cotton Mills (S. C.)	...	91
Aiken Mfg. Co. (S. C.)	95	98
American Spinning Co. (S. C.)	...	105
Anderson Cotton Mills (S. C.)	...	125
Arkwright Mills (S. C.)	115	...
Augusta Factory (Ga.)	...	72
Avondale Mills (Ala.)	82½	...
Belton Mills (S. C.)	...	101½
Bennettsville Mfg. Co. (S. C.)	...	100
Cabarrus Cotton Mills (N. C.)	125	...
Clearwater Bleby. & Mfg. Co. (Ga.)	100	102
Clifton Mfg. Co. (S. C.)	...	175
Clinton Cotton Mills (S. C.)	120	...
Courtenay Mfg. Co. (S. C.)	...	120
Darlington Mfg. Co. (S. C.)	86	...
Eagle & Phenix Mills (Ga.)	...	100
Enoree Mfg. Co. (S. C.)	...	85
Enterprise Mfg. Co. (S. C.)	90	95
Gaffney Mfg. Co. (S. C.)	108	...
Granby Cotton Mills (S. C.)	...	98
Granby Cotton Mills (S. C.) 1st Pfd.	...	101½
Graniteville Mfg. Co. (S. C.)	165	172
Greenwood Cotton Mills (S. C.)	100	...
Grendel Mills (S. C.)	100	102½
King, John P., Mfg. Co. (S. C.)	95	98
Langley Mfg. Co. (S. C.)	109	115
Laurens Cotton Mills (S. C.)	145	...
Lockhart Mills (S. C.)	...	109
Louise Mills (N. C.)	...	100
Lynchburg Cotton Mills (Va.)	125	130
Lynchburg Cotton Mills (Va.) Pfd.	145	150
Manchester Cotton Mills (S. C.)	...	109
Mayo Mills (N. C.)	150	...
McColl Mfg. Co. (S. C.)	...	103½
Newberry Cotton Mills (S. C.)	116	...
Odell Mfg. Co. (N. C.)	96	100
Orr Cotton Mills (S. C.)	...	102½
Pacolet Mfg. Co. (S. C.)	185	195
Pelzer Mfg. Co. (S. C.)	170	...
Piedmont Mfg. Co. (S. C.)	...	173
Poe, F. W., Mfg. Co. (S. C.)	125	130
Richland Cotton Mills (S. C.)	...	102
Richland Cotton Mills (S. C.) Pfd.	...	101
Roanoke Mills (N. C.)	90	100
Sibley Mfg. Co. (Ga.)	72	74
Southern Cotton Mills (N. C.)	...	105
Spartan Mills (S. C.)	125	135
Trion Mfg. Co. (S. C.)	120	...
Tucapau Mills (S. C.)	125	...
Union Cotton Mills (S. C.)	...	125
Union Cotton Mills (S. C.) Pfd.	100½	104
Victor Mfg. Co. (S. C.)	108	112½
Warren Mfg. Co. (S. C.)	97	100
Warren Mfg. Co. (S. C.) Pfd.	105	...
Washington Mills (Va.) Pfd.	100½	103
Whitney Mfg. Co. (S. C.)	115½	120
Wilmington Cot. Mills (N. C.) Pfd.	100	...
Wiscassett Mills (N. C.)	115	125

TRADE LITERATURE.

The Vulcanite Calendar.—Among the calendars for 1902 is that issued by the Vulcanite Portland Cement Co. of Philadelphia. The tasteful lettering will be a constant reminder to users of Vulcanite Portland cement that this product is of the highest grade in quality, and not a month but that presents a brief statement as to the cement's good points. The large figures in the date squares make this calendar especially convenient for use in large offices.

Graphite.—If you want to know all the facts about the different uses of graphite, read the monthly publication entitled "Graphite," issued by the Jos. Dixon Crucible Co., Jersey City, N. J. This publication has some interesting data in its February issue. A brief examination shows articles dealing with belt dressing and leather preservative, graphite lubrication, and one on "Graphite and Its Uses as a Lubricant from a Foreign Point of View."

Concrete Mixers.—Machines for mixing cement play an important part in the work required when constructing dams, docks, fortifications, etc., and their efficiency must satisfy some exacting users. Ransome's patent concrete mixers give this satisfaction. Two recent leaflets give some interesting facts regarding the Ransome mixer. For copies of same address the Ransome & Smith Co., 11 Broadway, New York city, which manufactures the mixer.

Standard Cleaning Powder.—The preparation of cleaning powders for use in and on buildings of every character and on surfaces of various kinds requires both knowledge and skill. Such powders manufactured by makers of many years' experience, who have devoted much time and money to perfecting their product, are in extensive use today. Savogran is termed "the standard cleaning powder," and its successful record of twenty-eight years' marketing well bears out the claim. A new folder issued concerning Savogran gives full particulars of its qualities. Address India Alkali Works, Boston, Mass., which manufactures the powder, for literature on the subject.

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California—Thirty-One Days' Tour via Pennsylvania Railroad.

The Pennsylvania Railroad personally-conducted tour to California will leave on February 25. Passengers will be transported to El Paso, Texas, in special Pullman cars. At the latter point they will be transferred to the "Mexico and California Special," composed exclusively of Pullman parlor-smoking, dining-room, drawing-room, sleeping, compartment and observation cars, which will be used over the entire trip back to New York. While the best hotels will be used where extended stops are made, the train will be at the constant command of the party.

Round-trip tickets, covering all necessary expenses, $375 from all points on Pennsylvania Railroad except Pittsburg, from which point the rate will be $370.

For further information apply to ticket agents, or address Geo. W. Boyd, assistant general passenger agent, Philadelphia.

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MANUFACTURERS' RECORD

Twentieth Anniversary Number

BALTIMORE, FEBRUARY 20, 1902

MANUFACTURERS' RECORD

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BALTIMORE, FEBRUARY 20, 1902

This issue of the Manufacturers' Record consists of two parts. Part I is the regular weekly issue, and Part II is the "twentieth-anniversary" feature, it having been deemed best to publish the latter in separate cover from the regular paper.

IN SIGHT OF THE PROMISED LAND.

The Alpine climber, in looking upward only, is impressed with the long and weary journey still ahead before he can reach the summit of his ambition. He feels that, despite his hard work, he has made but little progress. But presently, turning around, he looks down over the road up which he has been struggling. Then he realizes that he has, indeed, made great gain, and, seeing what he has accomplished, takes fresh courage and with renewed strength presses forward to the goal.

Like the traveler, the South has been doing some Alpine climbing. Out of the Valley of Desolation it started on its weary journey, hoping to catch the life-giving air of the Mountain of Prosperity. Upward slowly, but still ever upward, the South has been moving since first it started on this journey. Obstacles seemingly insurmountable have been overcome, and today the South stands on solid ground, looking joyfully upward to the summit of its hopes. The journey ahead is still a long one, and so it may be well, like the traveler, to look down over the road on which for twenty years it has been moving, and see what progress has been made.

Twenty years ago the Manufacturers' Record was born. It was started, as stated at that time, with a view to giving its energies to the industrial upbuilding of the South, and in commemoration of its twentieth birthday this anniversary number is issued, in order that the most noted authorities of the country may tell the story of what progress the South has made during the last two decades, and to set forth the reasons why it has the inherent strength to make still more rapid advance as it moves forward to that summit where peace and plenty for all its people shall be found more abundant than elsewhere on earth.

For twenty years the writer has been proclaiming the advantages of the South, and seeking to quicken its people to greater energy in their work of upbuilding. In this issue he prefers to leave the full story to others, and only to claim the reader's attention for a moment to point out some of the milestones which have marked its progress out of the valley, and which indicate the difference between the South of 1880 and the South of today.

It is true that our progress has not been quite commensurate with our natural advantages. We have had foes within and foes without, and some of the worst foes to our advancement have been those of our own household. But, broadly speaking, the story of the South, as told by many noted authorities in this issue, reads like a tale of romance, and would be so considered did we not stop to remember the marvels of this wonderful age and to consider the amazing advancement of our whole country, the wonder and envy of the world. It is not enough that we have kept step with the country at large. Taking fresh courage as we look back over the progress which we have made, it behooves us to measure up to the opportunity vouchsafed to this section, so wonderfully blessed above all other regions with natural advantages.

Twenty years ago the South, burdened with debts which had been largely imposed upon it by unscrupulous legislators, without any accumulation of wealth and without financial credit abroad, was just emerging from the wreck and ruin of war; its railroads were mainly short disjointed lines, poorly equipped, and in many cases almost, if not quite, bankrupt financially as well as physically; its laboring people were without industrial training as operatives, and its business men without experience in the management of industrial enterprises; its cotton mills were few and far between, and only here and there could the light of a furnace fire be seen. Starting under these adverse conditions, the South had to meet the competition of the North and West, which at that time were flushed with unprecedented prosperity. Their railroads were burdened with traffic; their capital and energy had for years been employed in the greatest and most profitable undertaking which ever fell to the lot of any nation—the building up and outfitting of the empire stretching from the Ohio to the Pacific coast. Millions poured into that section had returned with millions of profit to manufacturers, to bankers, to land-owners and to merchants. The great financial powers of Europe and America were concentrating their forces upon the upbuilding of that territory in order to make more valuable their vast investments in railroads and in land grants.

Under these diverse conditions, the fact that the South has been able during the past twenty years to keep pace with the rapid expansion of the North and West is in itself a high tribute to the people of this section, as well as a proof of the inherent strength of its industrial foundation.

In spite of the poverty of 1880, the South today is growing in wealth, increasing in population, and advancing in agriculture and in manufactures at a rate which practically guarantees that it will accomplish during the next ten years fully as much as it has done during the last twenty. The South has demonstrated to the final conclusion and its acceptance by the world that here will be the future situs of cotton manufacturing, and that in this section there will be created a cotton-mill industry rivaling that of the world at present. Out of the waste of cottonseed there has been created an industry representing an investment of $50,000,000 or more. It has proved that the predictions of 1880 regarding the South's pre-eminent position in the iron and steel world are to find a fulfillment in the near future. It has proved that the South can produce pig-iron at a lower cost than any other section of the United States, and can practically, under ordinary conditions, dictate the price of pig-iron in the world's markets. The perplexing problems connected with the creation of a vast iron and steel industry in this section have been solved. The long fight for capital and for the skill necessary to utilize our abundant stores of iron ore and coal and limestone, and turn them into the finished product of pig-iron and steel and machinery, has been won. It is no longer a question whether the South can compete with New England in cotton manufacturing, or with Pennsylvania and the West in iron and steel production, and with Michigan in woodworking; but it is a question whether in the future New England can meet the South's competition on cotton goods, whether Pennsylvania and the West can meet the South in the world's markets in iron and steel and the finished product therefrom, and whether Michigan can meet the South in furniture making.

Based on an ownership of one-half of the standing timber of the United States, the South is creating a woodworking industry which is destined to equal the combined woodworking development of the rest of the country. The furniture factories of Grand Rapids are finding their keenest and greatest rival in the furniture factories of High Point. The 20,000 miles of poorly-equipped railroads of 1880 have grown to 53,000 miles, with compact, well-managed systems which in equipment, in physical and financial conditions are rapidly taking rank with the best in the world. The story of the fortunes made in early days in wheat-growing in the Dakotas is more than rivaled by the marvels which are being wrought by rice-growing in Louisiana and Texas. The profit of orange groves and vineyards in California finds more than a duplicate in the early fruit and truck growing of many sections in the South, from the mountain peach orchards of Maryland, the apple orchards of the Piedmont slopes of Virginia, through the fruit and trucking regions of Nor-

folk and the Carolinas, Georgia and the Gulf coast to the fruit belt of Texas. A new industry, already yielding an aggregate of nearly $100,000,000 a year, has been created since 1880 in the growing of early fruits and vegetables for Northern and Western markets, and yet we have only seen the beginning of this gardening work.

Twenty years ago the South offered but few attractions in the way of comfortable hotels to the pleasure or health seeker wishing to escape the rigors of Northern winters. That was an industry undeveloped. Today we have in the hotels of Old Point, of Pinehurst, of New Orleans, of Asheville and a dozen other places, accommodations equaling the best which can be found in any resort region of the world; while in Florida the development of hotels has been so striking a feature as to make it almost impossible to adequately portray the wonderful advancement of East Florida, and to some extent of West Florida, as a result of the great work of Flagler and Plant. In all the signal development of the South there are few features calculated to do more for this section than these magnificent hotels, which have turned the tide of travel of the North and West to the South, annually bringing to this section tens of thousands of health and pleasure seekers.

We have increased our coal production from 6,000,000 tons in 1880 to over 50,000,000 tons last year, but we have only opened a small mine here and there, when compared with the extent of territory and of wealth of coal in the great coal area of the South. Twenty years ago the South produced less than 200,000 barrels of oil a year. West Virginia alone is now producing over 15,000,000 barrels a year, and the extension of this oil field into Kentucky and Tennessee and into the farther South is every day being emphasized by the boring of new wells; while, turning to the Gulf, Texas has startled the world with an oil supply so far beyond our comprehension that it is almost folly to attempt to predict what may be its influence in revolutionizing many of the industries of Europe as well as of America.

But the statistics which tell the story in cold figures of what has been accomplished, and tell how our pig-iron production has grown from less than 400,000 tons to 2,600,000 tons, our cotton-mill capital from $21,000,000 to $150,000,000, our total manufacturing capital from $250,000,000 to $1,100,000,000, our exports through Southern ports from $261,000,000 to $510,000,000, tell us really but a small part of the work which has been accomplished.

These figures only indicate something of the story. The true advancement, and that which is destined to have the greatest effect upon this section and upon the world by reason of the competition of this section, is the experience which has been gained, the industrial training secured, by the factory hand as well as by the superintendent and the president, in the knowledge of how to do things, and in a knowledge of the foundation which we have in natural resources out of which to create business interests. These are really the measure of our advancement far more than what can be told by statistics. Against the poverty, the inexperience, the discredit and doubt at home and abroad of ourselves and our section of 1880, the South stands today recognized by the world as that section which of all others in this country or elsewhere has the greatest potentialities out of which to create wealth, and in the development of which to give employment to people. It has already accumulated capital almost sufficient for its own needs, and it no longer has to seek in vain, as in 1880, for outside aid, where outside aid is needed, for the capitalists of the country are "spying out" the land, looking for opportunities for investment. And not only is the capitalist "spying out" the land, but the homeseeker, the farmer, the mechanic, the health and pleasure lover are all turning their thought and investigation towards the wealth of opportunity to be found in this section. The tide of immigration has turned this way, and henceforth we shall have the Northern man, the Western man and the European all uniting in friendly rivalry with the native Southerner in the utilization of the resources presented by the climate, the soil, the minerals and the timbers of this favored region for the development of a section which, more abundantly blessed by nature with a greater combination of advantages than any other region, must inevitably become the center of greater industrial and business activity and greater wealth than any other.

Then let us, having viewed the path over which we have traveled, turn with redoubled energy to the mountain heights ahead.

TWENTY YEARS OF WORK FOR THE SOUTH.

The idea which became the Manufacturers' Record was born at Baltimore in February, 1882. It was conceived in a union of the knowledge of the wonderful natural resources of the South and the desire to bring to bear upon them adequate influences for their complete enjoyment. The time was auspicious for such a creation. In the preceding fall the Cotton Exposition at Atlanta had shown to an amazed country what the South had done of itself, removed but a few years from unexampled prostration; what its potentialities were, and how warm it was to welcome co-operation of a common country for their realization. Men from other sections had found it profitable to be exhibitors at Atlanta. They told their friends and neighbors of their success, and gave them hints of wonders still to be revealed. There was a consequent anxiety to learn something more about the possessions of a land that had for many years been veiled in the dust of acrimonious politics. A medium of prompt and accurate information was demanded—a newspaper which should be the agent for calling into fructifying touch alert, vigorous and sagacious money and fat lands, rich mines and luxuriant forests, the raw bases of a people's prosperity, and to cultivate among men of all parts of the United States the conviction of the importance of the South to the nation's well-being, and of the necessity for friendliness toward it and between it and other sections.

The demand was met immediately in the Manufacturers' Record. At first it was but a special department of the long-established Journal of Commerce, of which its founder was editor. Presently, it was recognized that the department was of such sturdy parts as to require independent existence. A few months' experience demonstrated that there was a live need for a paper which should adequately represent the manufacturing interests, and should keep abreast, if not ahead, of the rapid march of productive affairs in the South. The venture had been so well received by the manufacturers of the country that it was deemed advisable to extend its scope and to widen the field of its usefulness. So it entered the field, a stripling of sixteen pages, but a stripling of determination, and thoroughly grounded in the faith that "the development of the South means the enrichment of the nation." That was its impulse. Its purpose was to aid to the best of its endeavors the upbuilding of the South. To that end it has labored for twenty years.

Its policy was clearly outlined in the first few months of its publication, when, in special articles or in editorials, it discussed such subjects as gold-mining in Georgia, iron-making in the South, silk culture, the opportunity for sales of machinery, exports of manufactured goods, increase of cotton mills in South Carolina, and the relative positions of the textile industry North and South, British capital in the South, cottonseed-oil manufacture, a proposed line of steamers between Florida ports and Liverpool, the iron ores of Tennessee, and the beginnings of cotton manufacturing in Texas. With these were joined persistent urging of Baltimore to strengthen in trade its natural ties with the South and to become truly representative of that progressive section, while from the start the fundamental ground was taken, to be held permanently, that legislation antagonistic to railroads or similar corporations was most unwise, inasmuch as the South could not afford to be unfriendly to the influences whose direct interest it was to develop the country upon which they depended for business. These subjects have been treated again and again in various forms, but never with the least shadow of turning. As the years have passed original contentions of the Manufacturers' Record regarding them have received the approval of experience, which has made the more potent the views it has been called upon to express in other directions and with a broader range. Throughout all it has asserted the right to speak as it has been moved by its convictions in the interests of the South and the right of others to disregard local sentiment or temporary advantage in working toward the common end, the substantial progress of the Southern people. It has consistently placed business before politics, and has maintained that the best politics is the politics that would help the South permanently, however it might be named, and utterly oblivious to the fortunes of any party as a party.

A logical consequence of this has been that the Manufacturers' Record has numbered among its contributors practically every man in the United States or abroad whose observations or suggestions about the South have been worth publishing. It has been most heartily backed up in that way by Cabinet officers, members of both houses of Congress, governors and other State officials, men active in all lines of Southern advancement, leaders of the best thought and opinion of all sections, and intelligent, far-seeing observers in foreign parts. Their promotive work, their appreciative and their encouraging words have been matched by the writings and investigations of specialists of repute and authority in mineralogy, geology, forestry, railroad construction and operation, many lines of manufacturing, agriculture and education of the practical sort, who have been employed to open, through the Manufacturers' Record, new and broadening lines of information about Southern prospects for the investor, the homeseeker and the worker.

In all the phases of its steady growth it has preserved and increased its value as a distinctive newspaper to such an extent that it holds the reputation of being "the most widely-quoted industrial paper of the world." The foundation of this was laid in the following announcement of the early days: "The Manufacturers' Record, as the representative industrial paper of the South, desires to give publicity to all information of value relating to the manufacturing or mining interests and the iron, steel and hardware trades of that section. The marvelous development of cotton-manufacturing, mining and kindred interests of the Southern States is now attracting the attention of the business world, and information relating to these things is eagerly sought after by the manufacturers and business men generally of other sections of the United States as well as of Europe. It is our aim to gather up all the facts relating to the material progress of the South and present them in such a way as to draw increased attention to the South. With this object in view we solicit items of news relating to the establishment of new mills, factories and furnaces, the opening of new mines, the purchase of new machinery or the enlargement of already established manufactories, etc. Information of this kind, when of acceptable character, will be published free of any charge whatever."

It was a unique idea, this offer to give free circulation to facts at which old-school journalism was prone to shy as containing the germs of advertisement. But that was exactly the Manufacturers' Record's point. It was determined to advertise the South as it never had been advertised. Its success in that direction made it the acceptable medium for advertisement within set lines of individuals and corporations, who saw through its columns the South beckoning them to enlarged business. Out of the first invitation grew the exceedingly valuable feature of the Manufacturers' Record, its "Construction Department," with its Daily Bulletin, the vade mecum of thousands of different participants to their profit in the energies contributing to the growing industrial importance of the South.

In line with this program, and with that of persuading New England mill men that the best place for cotton mills was near the cotton fields, was the fact that through the efforts of the Manufacturers' Record the New England Cotton Manufacturers' Association held in 1895 its annual meeting at Atlanta, the first meeting beyond its own borders. The gathering there was a result of personal correspondence with every member of the Association and a token of the influence exerted by the Manufacturers' Record outside its own section.

Its complement was the incident of December, 1894. In that year the South had raised a notable crop of corn. The day before Christmas brought news of distress and suffering among farmers of Nebraska and other States in the Northwest by reason of a failure of their corn crop. Prompt action was demanded. It would be three days before the situation could be presented through the columns of the paper to the people of the South. Therefore, an appeal to the South to send corn and provisions to the Northwest was sent by the editor through the press associations. The response came at once in the offer of railroads to furnish free transportation for the contributions, in the organization of committees in many communities to forward the work, and in the prompt shipment of $50,000 worth of foodstuffs to the sufferers. The gifts included a trainload of coal from West Virginia, twenty-two carloads of bacon, corn and flour from Georgia, and fifteen carloads of rice, sugar and molasses from Louisiana. The spontaneous generosity of the South had an unexpected answer. It opened at a vital moment the eyes of the Northwestern farmers to the productive capacity of the South. It started in that direction the steadily-swelling streams of immigration of sturdy, thrifty farmers, among the primary movements being the purchase of 100,000 acres of land in Georgia, upon which has grown Fitzgerald, largely populated by Union veterans.

Another practical suggestion from the Manufacturers' Record came to the first annual convention of the National Association of Manufacturers at Chicago, in January, 1896, in a written plea for the creation of a new department of the government to meet the needs of American manufactures and commerce. This was epitomized in the sentences: "The development of our foreign and domestic trade and commerce and of our industrial interests is steadily broadening, and we are now preparing to make the world the market for our manufactured products. We have reached a point in our history where, as a nation, we cannot only care for our rapidly-expanding consumptive requirements, but where we can expect to gain a fair share of the world's trade. * * * We have reached a period in the history of the United States and in the progress of manufacturing growth when expansion is necessary and when we must begin to seek wider fields for the extension of our trade. Because of these conditions it would seem to be desirable that the manufacturing interests of the United States should at least receive from Congress the same recognition which was years ago granted to agriculture, namely, the creation of a Department of Manufactures and Commerce." The enthusiastic seconding of this suggestion by the National Association of Manufacturers has been sustained by it ever since, and, reinforced by the sentiment of the country nourished by it, is about to be realized as these words are written.

Such facts are recalled at this time to indicate the broad lines upon which the Manufacturers' Record has worked, whether it was opening the way to investment of outside capital in the South, advocating an established fiscal and commercial policy on a non-sectional basis, the opening of an isthmian waterway, the building of first-class roads, the improvement of rivers and harbors upon a systematic and comprehensive plan, or doing its best to provide facilities for suitable training of the rising generation to meet their enhancing responsibilities. In everything it has done it has kept its gaze fixed upon the main, the dominating issue—the progress and the prosperity of the South. Succeeding years will not divert it from its successful course.

THE SOUTH AS VIEWED ABROAD.

From the moment when it began its work for Southern development the Manufacturers' Record has, without ceasing, called attention to the wonderful natural resources of the South and the opportunities there for the investment of mind, muscle and money. At times it has ventured upon predictions based upon accomplished facts and upon latent powers certainly revealed in actual achievement. It has sought to make good those predictions by constantly hammering upon the same lines, in spite of apathy at home and incredulity elsewhere. At the end of twenty years it is in a position to point to fulfillment of prophecy. No better way of doing this may be had than in presenting a review of the progress made by the South. It would be a pleasant task for the Manufacturers' Record to make this review itself or to avail itself of the experience and knowledge of Southern men who have been identified with the advancement of their section, but it has thought that the review would be the more valuable and the more inspiring if made by men of national reputation, North or South, and by world-wide authorities in their respective fields. Its invitations to men of this character have been readily accepted, and as a result this anniversary issue is filled with thorough, comprehensive papers upon agriculture, transportation, finance, commerce and the leading Southern industries, which, together, make a volume which will be exceedingly important for authoritative reference during many years to come. It is in reality a condensation, statistical and otherwise, of the industrial history of the South not only for the past quarter of a century, but for fifty years or more, for the special writers have not confined themselves to a mere record of events since 1880, but have detailed the reasons for them, and have pointed to the possibilities inherent in them. These contributors include officials of the scientific departments of the United States government, men of national standing as experts in finance and transportation, others who have made prolonged study of Southern conditions, and others who have long been prophets of Southern development and have participated therein by actual investment or through publicity in the undertakings which have made the South. We feel sure that no publication ever issued in this country had a more remarkable list of contributors. Their views must have a world-wide influence in strengthening the upward movement of the South's material interests.

Prominent among these contributors is Mr. J. Stephen Jeans of London, secretary of the British Iron Trade Association, who is convinced by prolonged and close observation of Southern endeavor that he knows of no section in the United States, "with its cup of blessings fresh from Nature's hands, so overflowing as the Southern States." He does not believe the South is doing all it could do, especially in iron and steel, measured by its advantages, and after pointing out some of the difficulties which have delayed its advancement, he says, referring to iron and coal matters: "There are not many Alabamas in the world; there is no other in the United States. In some degree the same remark applies, mutatis mutandis, to other iron-making centers of the South. If I were seeking an investment for my children or myself, if I had been a young man, I think I would vary Horace Greeley's injunction and 'Go South.'"

This view has confirmation from Mr. James M. Swank, general manager of the American Iron and Steel Association, who writes: "The resources of the South for the continued production of pig-iron on a large scale are ample. Taking the South as a whole, there is no scarcity of either iron ore or of good coking coal. Until recently it has been supposed that the South could never become a great steel producer, as it

possesses but little iron ore that will make pig-iron suitable for conversion into acid Bessemer steel, which is the only kind of Bessemer steel that is now made in the United States. Such pig-iron of this quality as is now used at Baltimore, Wheeling and Ashland is made wholly from imported ores or from Lake Superior ores, but the rapid development in late years of the basic open-hearth steel industry in this country has not only furnished a market for large quantities of Southern basic pig-iron, for the manufacture of which large deposits of Southern ore are especially adapted, but it has encouraged the embarkation of capital in the manufacture in the South of basic open-hearth steel itself, the best fruits of which important innovation we now see at Ensley, Ala. All in all, the outlook for the iron and steel industries of the South is remarkably bright. The critical period of experiment, doubt and poverty of capital has passed."

The passing of this poverty is noted by Mr. James H. Eckels of Chicago, ex-comptroller of the currency, who finds greater bankable wealth and increased banking facilities, the feature of which is "that it is Southern wealth developed in the South, and largely owned by Southern men, which is doing this thing."

An article appearing many years ago in the Manufacturers' Record was largely responsible for a primary investment in Southern industry by Charles A. Schieren of New York, and for a close study by him of this section. In the light of his knowledge, gained by investigation and experience, he makes the following prediction about the South: "It has a splendid future before it. Its natural resources have hardly been touched. It will reap a larger share of the development of our future growth in this country, and will be an important part of our great manufacturing and progressive industrial system, which seems to be the marvel and wonder of the entire civilized world."

Independence of the South for its supply of iron ore, coal, cotton and lumber, the great foundations of manufacture, is the idea dominant in the review made by Mr. Theodore C. Search, president of the National Association of Manufacturers, in which he says: "This is peculiarly a Southern condition. New England, the oldest, busiest and most advanced manufacturing section of the country, produces but little of the materials consumed in her industries, but must go to Pennsylvania for iron and coal, and to the South for cotton and for much of the lumber that is required. The South, therefore, enjoys a peculiar advantage in finding at home all the materials for her industries, and it is self-evident that the utilization of these vast resources at home is immeasurably more advantageous than the sale of materials to manufacturers in other sections of the country. It is very clear that the circulation within the South of the several hundred millions of dollars in continual use by the manufacturing industries adds more than can be estimated to the general prosperity of that section and to the stability of its well-being."

Mr. Edward W. Parker, managing editor of the Engineering and Mining Journal, finds the cue to the unparalleled industrial awakening of the South in the statistics of its coal production. He makes a comprehensive analysis of these, and complementary to his study are the papers by Dr. David T. Day of the United States Geological Survey, dealing with all the minerals, and of Mr. F. H. Oliphant of the same Survey, and Mr. C. F. Z. Caracristi, dwelling upon petroleum, the first going extensively into the manifestations in the Appalachian field and the second giving most of his attention to that of Texas.

Mr. John H. Converse of the Baldwin Locomotive Works of Philadelphia regards the standardizing of the gauge of Southern railways as one of the most important and significant transactions in our railroad history, and Mr. John P. Meany, the editor of Poor's Manual of Railroads, presents the figures showing the wonderful progress in Southern railroad building, which Mr. Converse regards as strongly indicative of Southern development.

These figures are reinforced by the opinion of Mr. M. E. Ingalls, president of the Cleveland, Cincinnati, Chicago & St. Louis Railroad, that "if there is anything on earth that represents the new South today, it is the railways of the Southeastern country. In physical condition, in management, in facilities for the public, they compare favorably with any section of the country. Ten years ago they were, in many cases, a broken-down and disjointed lot, unable to serve the public or themselves." Mr. James McCrea, first vice-president of the Pennsylvania Lines West of Pittsburg, in a recent trip South, found the railways sharing the general prosperity, and Mr. W. W. Finley, second vice-president of the Southern Railway, and Mr. J. T. Harahan, second vice-president of the Illinois Central Railroad, tell of the causes of that prosperity and of the great future ahead of this section.

Mr. P. J. Goodhart of New York also points to the work done by the great railroad systems of the South, and suggests that they should unite in a special effort to secure for their section a fair proportion of the German, English and Italian immigrants who reach New York at the rate of about 350,000 annually. He suggests a joint headquarters at New York, and expresses the belief that great results will quickly follow the turning of the tide of immigration toward the South.

Col. A. B. Shepperson of New York, the statistical expert in all matters relating to cotton, traces accurately and broadly the wonderful changes in the cotton-mill industry. There has been wrought almost a revolution in this respect, based upon the long-established Southern staple; but, nevertheless, Secretary James Wilson of the United States Department of Agriculture does not think that the South will be much longer known and thought of primarily as the land of cotton. He says: "With the great industrial progress of the Southern States and the development of their wonderful mineral and manufacturing resources comes the best of all markets for the farmer—the great home market. More and more I hope to see the agriculture of the South diversified as this great home market expands. Let the cotton crop continue to increase in total production, but let its growth be rather by higher average per acre than a very large extension of the area under this crop. Let Southern farmers keep the plant food at home, and send the products of the farm to market in the form of manufactured articles (manufactured on the farm by nature's processes) rather than in the form of raw material. Let them grade up their flocks and herds, and keep many more of all kinds of domestic animals. Let them renovate the soil by the use of legumes, and save all the fertilizing material that the farm itself produces. Then will the agriculture of the South show in the census to be taken in 1910 advances greater by far than even the great progress made in the last twenty years of her history."

Diversification in agriculture has been accompanied by diversification in the industries founded upon lumber. The permanency of these industries depends upon the care of Southern forests. The importance of this is dwelt upon by Mr. B. E. Fernow, director of the New York State College of Forestry, who makes a strong plea for scientific management of the Southern timber reserves.

Directly consequent upon railroad, agricultural and industrial expansion has been the growth of foreign commerce at the South. This Mr. O. P. Austin, chief of the bureau of statistics of the United States Treasury Department, shows has more than kept pace with the phenomenal development which has characterized our national commerce, while Director William R. Merriam of the Census reviews elaborately manufactures, touching which Mr. Edw. H. Sanborn, general manager National Association of Manufacturers, gives timely hints.

It is pleasant to note that these manifestations have not changed the distinctive traits of what was best of the old South. That is the view of ex-Gov. David R. Francis of Missouri, president of the Louisiana Purchase Exposition Co., who says: "The old-time hospitality, with its ineffable charm, its chivalry, its deference to high social ideals, its sturdy adherence to honorable business methods—all these are happily left, and the whole country is the better for it. The South is to be congratulated, because, in her great commercial and industrial prosperity, she has lost nothing of her shining, distinctive characteristics."

Some persons, however, such as Mr. H. M. Atkinson, a native of New England, who has spent several years at Atlanta, offer suggestion and commendation, and as Mr. F. B. Thurber of New York, friendly criticism born of their interest in the South, while Hon. Abram S. Hewitt of New York gives the kindly advice: "There is no corresponding region on this habitable globe which has so many advantages as the South, all available by natural or artificial communications, and capable of more economical operations than in any other part of the country. The Manufacturers' Record has done its part in directing attention to the possibilities of the South, which, it seems to me, owes to it a debt of everlasting gratitude. Your recent address in favor of industrial education is one of the most valuable contributions which has ever been made to the conscience and interests of any people, and if it is acted upon the South will become the garden of the world."

Of the practical-minded prophets of Southern greatness who live outside the South, Mr. Hewitt is undoubtedly the leader. The strong note of encouragement which he has sounded for many years is as strong as ever in his letter, which is a timely rounding up of the prophecy of facts and figures herewith presented. His note should be swelled into a mighty volume of sound, becoming effective in action for greater advance than ever in the South.

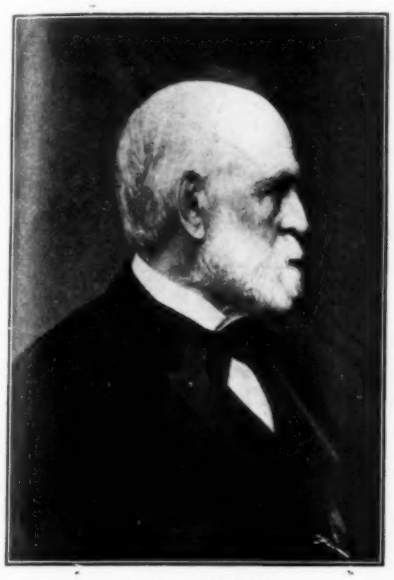
It was the desire of the Manufacturers' Record to publish in this anniversary issue representative views of the future of each of the Southern States from their respective governors. The invitation to the governors was accepted by less than half a dozen of them. From the others, with one or two exceptions, came the reply that they were too busy to accept the invitation, This in explanation.

The South as the Garden of the World

By ABRAM S. HEWITT
of New York

I am in receipt of your letter asking me to make a brief statement as to the industrial resources of the South, and of the development of these resources which has taken place during the last twenty years.

I was first made acquainted with the great mineral resources of the South about the year 1850 by Prof. Lewis Troost of the University of Kentucky and by Prof. J. Lawrence Smith, both of whom were residents of Louisville. As savants they had no superiors in this country. The son of Professor Troost was the chief engineer of the line of railway which was projected between Chattanooga and New Orleans, running through Wills valley and the region where Birmingham is now situated. From him I received very accurate accounts of the formation of fossiliferous ore in Red mountain, and of the extraordinary extent of the coal basins which would be traversed by the railroad. Acting upon his advice, I secured options on a large amount of iron land, but I took none upon coal lands, because the area of iron land was adequate to any conceivable demand. After the outbreak of the Civil War, however, these undertakings were all deranged, and I thought no more of them until peace was restored. I then directed what capital I could command to the inauguration of industries which would employ the shipwrecked energy of the South. The capital which I then invested has always remained in the South, and has in the main been productive, although it was not invested in the most attractive localities, which were in the neighborhood of Elyton, Ala. The progress since that time has been marvelous, but is no more than might have been expected from the unequalled riches of the country in coal and iron. I refrain from any reference to the cotton industry, for which the South is pre-eminently adapted. The water-powers of the South are upon a scale of grandeur unequalled elsewhere, and will in the future be all utilized for productive industry. Every element for success exists in the South—in raw material, in climate, in the natural forces of nature, and, above all, in an abundant supply of labor, which, when properly trained and disciplined, will be the main reliance of the South in the future for its prosperity. It only remains for the South to do its duty to its black population by way of training and educating in the simple manual trades. Provision should be made by which every child in the South, white and black, should receive the elements of an ordinary education and a knowledge of how to use the primitive tools which lie at the basis of the mechanic arts. There is no difficulty whatever in giving such instruction. It will cost money, which the South can now well afford to expend. The result in a single generation will be such a revolution in the character of the whole people as will surprise the world.



ABRAM S. HEWITT.

There is no corresponding region on this habitable globe which has so many advantages as the South, all available by natural or artificial communications, and capable of more economical operation than in any other part of the country.

The Manufacturers' Record has done its part in directing attention to the possibilities of the South, which, it seems to me, owes to it a debt of everlasting gratitude. Your recent address in favor of industrial education is one of the most valuable contributions which has ever been made to the conscience and interests of any people, and if it is acted upon, the South will become the garden of the world.

Abram S. Hewitt

EVIDENCES OF PROSPERITY ON ALL SIDES.

Mr. James McCrea, first vice-president of the Pennsylvania Lines West of Pittsburg, writes to the Manufacturers' Record:

"Your letter of January 14, asking me for a few words expressing my views in regard to the improvement of the South, reaches me en route returning from a trip through that country, and I am glad to say that my observations of this trip confirm previous observations, which show a steady improvement in all branches of business. The agricultural, iron, coal, lumber and manufacturing industries all seem to be in a most healthy state, the railroads are in most excellent physical condition, and evidences of prosperity are to be seen on all sides, and I believe them to be on a firmer basis than ever before."

Southern Money in Banking

By JAMES H. ECKELS
Ex-Comptroller of the Currency

There has been nothing more noticeable in the development of the United States since the depressing years from 1892 to 1897 than the progress throughout every line of industry which has characterized the Southern States. There is no branch of commercial or manufacturing undertaking but that has shown not only a marked, but a substantial growth—a growth which means better things in the future and larger investment returns.

It is not impossible that within another decade the world will witness the bulk of cotton-weaving done within the borders of the States where cotton is raised, while Southern steel furnaces are supplied with Southern iron ore and heated with Southern coal.

The agricultural interests are becoming more important, making the farmer more independent and the laborer's condition less distressing.

With all this better state of affairs has come, as a natural sequence, more bankable wealth, requiring increased banking facilities. The South is now coming into a full realization of the fact that banks are an essential element in commercial and industrial progress, and that in order to keep abreast of the times banking institutions of credit must be availed of in order to make every dollar as efficient as possible. By this development of banking in all of its branches the deposited dollar, with the credit instrument, the check drawn against it, to be redeposited in the cancellation of debts, makes possible the development of enterprises heretofore impossible.

The increase of bank facilities in the South has another feature about it which is not alone a source of congratulation to the people of that section, but to the whole country. That feature is that it is Southern wealth developed in the South and largely owned by Southern men which is doing this thing. The noticeable defect in not a few banks in suddenly-developed and over-boomed Southern cities prior to 1892 was that they were promoters' banks, organized with borrowed money, with local interests not deeply interested in their lasting and success. The result of all this was easy borrowing, unwise speculation, accumulated debt and ultimate widespread disaster. The lesson then learned has not been forgotten, and no section of the country today presents better illustration of progressive banking methods, coupled with conservative soundness, than the South. The healthful tone of having banks owned by resident people, and not born of mere promotion to advance some personal temporary interests, is most apparent to one who is acquainted with conditions as they were and conditions as they are. The closer interdependent relations between banks in all sections of the country and the business interests thereof, too, has had its effect in making for sounder banking operations and a more diligent study of accounts. There never was a time when business relations were as close between the peoples of all sections of a common country as at this time, when on every hand we see the evidences of utmost commercial and manufacturing activity. In all these matters involving business risk, business loss or business gains, the bank is playing the leading part, because the bank is the clearing-house for them all. The banker is aiding them both by the extension of credit to proper and soundly-conceived and wisely-managed undertakings, and by the refusal of credit to unworthy ones.

In the South the banker is doing wisely his duty in both directions. The circumstances of want of capital, which in the South for a long time militated against the building up of many banking-houses of extensive means and far-reaching connections, is each year becoming less noticeable, and I venture the prediction that before ten years more shall elapse we will see in every Southern city one or more great banking-houses of wide power and influence, with large capitals and deposits. If such banks could be granted the right to establish branches for the smaller communities and less densely-populated agricultural districts, the benefits thereby attained to all interests would be immeasurably great.

James H. Eckels

Foundation of a Stable Superstructure

By W. W. FINLEY
Second Vice-President Southern Railway

To anticipate the position a section of a country may be expected to occupy requires that one take into consideration its inherent sources of wealth, enterprise and knowledge, and the conditions that environ it. That the Southern States are occupying a large influence in the manufacturing, commercial and agricultural life of the nation there can be no doubt. Iron ore and coal in abundance, fine timber districts, wide areas of fertile land and a resident population from which has sprung much that has made this country great and prosperous are sources of power which will achieve even greater success. Add to this a mild and healthy climate, a spirit of push and enterprise, which has made Southern development the marvel of all who have taken note of it, and one has a foundation upon which may be reared a stable and lasting superstructure. Such are the conditions in the South today.

Blessed with a variety of resources and with a variety of efforts occupying the attention of its people, it is necessary to study its growth and progress

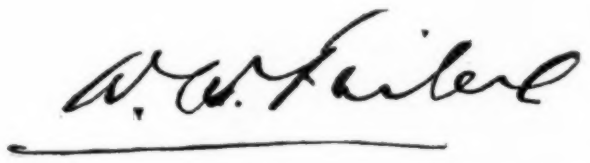
along a variety of lines. The opening up of the large deposits of coal, iron and other economic minerals has as yet, taken as a whole, scarcely progressed farther than to uncover the immense storehouse of wealth hidden within the confines of the Southern States, and we have reason to expect that the future will see a very extended development of Southern mines, and that the production of these raw materials and fuel will bring about a corresponding growth of allied manufactures. The same may be said of the utilization of the timber resources of the South and the manufacture of lumber into its diversified products.

The development of the agricultural resources of the South will be one of the most conspicuous movements in the future of that section. No portion of our country admits of such a diversity of agricultural products.

The South has made splendid progress in recent years in the development of manufacturing, especially along the lines of cotton, wood and iron. In the supply of raw material for these industries, as well as fuel, as has been above noted, the South has been richly endowed. We can expect the development in manufacturing industries to continue in the same ratio as these raw materials are uncovered and a market is found for the manufactured product. Profitable manufacturing industries and productive farms make wealth in the community possessing them; consequently, as industry and agriculture develop in the South, its cities, towns and villages will vie with each other in their public improvements. This is well illustrated in the large sums of money now being expended throughout the South in new streets, sewers, water-works, electric-light and street-railway plants, public buildings and those accessories of a prosperous and progressive community. The interest now taken in the betterment of the public-road system of the South will bear fruit in the near future.

The climate is one of the South's most valuable resources. Thousands now seek a retreat there from the rigors of the Northern winters, and others find in its mountains relief from the heat of summer. This movement has been steadily growing in recent years, and will undoubtedly reach very much larger proportions.

The South is now enjoying a very marked period of industrial and commercial progress. Its resources have been widely advertised, and capital and enterprise have come forward from both home and abroad to aid in their development.



The Southern Iron and Steel Industries

By JAMES M. SWANK

General Manager of the American Iron and Steel Association

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Counting Maryland as a Southern State, and excluding Delaware, both having been slave States down to the Civil War, there are nine Southern States which now make pig-iron—Maryland, Virginia, West Virginia, North Carolina, Georgia, Alabama, Tennessee, Kentucky and Texas. All these States except North Carolina and Texas also roll iron and steel, and most of them make steel itself in some form. Their pig-iron industry is, however, of first importance. The following table gives the production of pig-iron in the nine Southern States in 1872, 1880 and 1890 in gross tons. The year 1872 is chosen for comparison with later years because statistics for 1870 are wanting. All the statistics that are presented in this paper are for calendar years, and are given on the authority of the American Iron and Steel Association:

States.	1872.	1880.	1890.
Alabama	11,171	68,920	816,910
Tennessee	37,905	63,279	267,625
Virginia	19,147	26,727	292,779
West Virginia	18,568	62,802	129,438
Kentucky	60,175	51,525	47,861
Georgia	2,630	24,394	29,185
Maryland	56,278	54,854	147,821
Texas	553	2,232	9,701
North Carolina	958	.....	2,840
Total	207,385	354,733	1,744,160

The following table gives the production of pig-iron in these Southern States in 1900 and 1901, in gross tons:

States.	1900.	1901.
Alabama	1,184,337	1,225,212
Virginia	490,617	448,662
Tennessee	362,190	337,139
Maryland	290,073	303,186
West Virginia	166,758	166,597
Kentucky	71,562	68,462
North Carolina and Georgia	28,984	27,333
Texas	10,150	2,273
Total	2,604,671	2,578,864

The total production of pig-iron in the United States in 1900 was 13,789,242 tons, and the nine Southern States above mentioned made about 19 per cent. of this total. The total production in 1901 was 15,878,354 tons, and the nine Southern States made a little over 16 per cent. of the total.

Of the total producton of pig-iron in the nine Southern States in 1900 there were made with charcoal 99,755 tons, and with mixed charcoal and coke 44,608 tons; 17,288 tons were made with anthracite coal and coke mixed; the remainder was made with coke and a small quantity of raw bituminous coal. Three States—West Virginia, North Carolina and Kentucky—did not use charcoal in that year. In 1901 there were made with charcoal 90,629 tons; with mixed charcoal and coke, 23,294 tons; with mixed anthracite and coke, 2738 tons, and with coke and a little raw bituminous coal, 2,462,203 tons.

Prior to 1860 there were no coke furnaces south of the Potomac region; all used charcoal. In May of that year Bluff furnace at Chattanooga was successfully blown in with coke by the East Tennessee Iron Co., after having previously used charcoal. It ran but a short time. The first coke furnace built in the South after the war was the first of the two Rockwood furnaces at Rockwood, in Roane county, Tennessee. This furnace was built in 1867 by the Roane Iron Co., of which Gen. J. T. Wilder and Capt. H. S. Chamberlain were the leading spirits. It was successful from the start.

In the following table we give the total production of pig-iron in the same Southern States in each year from 1872 to 1900, accompanied by the total production of the whole country in the same years. Production in the Southern States has fluctuated with the total production, but a steady upward trend during most of the years will be observed, particularly in the six years preding 1901, when there was a slight decline:

Years.	Southern States. Gross tons.	United States. Gross tons.
1872	207,385	2,548,713
1873	223,246	2,560,963
1874	240,303	2,401,262
1875	190,240	2,023,733
1876	151,280	1,868,961
1877	181,392	2,066,594
1878	203,568	2,301,215
1879	256,397	2,741,853
1880	354,733	3,835,191
1881	421,018	4,144,254
1882	515,424	4,623,323
1883	624,339	4,595,510
1884	587,142	4,097,868
1885	636,460	4,044,526
1886	781,410	5,683,329
1887	829,854	6,417,148
1888	1,011,480	6,489,738
1889	1,398,841	7,603,642
1890	1,744,160	9,202,703
1891	1,708,966	8,279,870
1892	1,890,167	9,157,000
1893	1,567,299	7,124,502
1894	1,268,425	6,657,388
1895	1,702,093	9,446,308
1896	1,834,451	8,623,127
1897	1,913,346	9,652,680
1898	2,083,726	11,773,934
1899	2,360,554	13,620,703
1900	2,604,671	13,789,242
1901	2,578,864	15,878,354

The whole number of completed blast furnaces at the close of 1901 in the nine Southern States above mentioned, not counting abandoned furnaces, is 120, of which total number Alabama has 45, Virginia 26, Tennessee 21, Maryland 6, West Virginia 3, Kentucky 8, North Carolina 2, Georgia 5, and Texas 4. Most of these furnaces are of modern construction, and some of them are furnaces of large capacity. The whole number of completed furnaces in the United States at the close of 1901, again dropping all abandoned furnaces, was 406. It will be seen at a glance that more than one-fourth of the whole number of furnaces in the country are in these nine Southern States. The production of pig-iron in these States may be expected to steadily increase in the years that are immediately before us, although the production in 1901 was somewhat less than in 1900. The Northern and Western States are large buyers of Southern pig-iron, and considerable quantities have been shipped abroad, but during 1901 the foreign demand was much less than it had been. The extraordinary demand from other sections of our own country partly compensated, however, for this falling off in foreign orders in that year. In addition to the furnaces above mentioned as completed in these nine Southern States, two new furnaces are now being built in Alabama and one in West Virginia. In the whole country twelve new furnaces are now in course of erection.

Outside of Maryland, West Virginia and Kentucky but little steel of any kind has ever been made in the South. These three States are now large producers of Bessemer steel at Sparrow's Point, Wheeling and Ashland, while there are a few open-hearth and crucible steel plants in other Southern States. At Ensley, Ala., the Tennessee Coal, Iron & Railroad Co. has recently completed the building of a large basic open-hearth steel plant, the most extensive steel plant of any kind that has ever been established in the extreme South. It will roll billets, rails, structural steel and other finished forms, and make all kinds of steel castings. The total annual capacity of this plant, which is soon to go into operation in every department, some departments having been started in 1899 and 1900, is estimated at 300,000 tons of ingots. The annual production of this and the other Southern steel plants in the near future will probably exceed 600,000 tons of finished products. There are many rolling mills in the South which are not connected with steel works, and these annually roll about 250,000 tons of finished iron and steel products, so that the total finished iron and steel production of the South when the Ensley plant is in full operation will approximate 1,000,000 tons annually. The South is today producing a larger variety of rolled iron and steel products than at any previous period in its history. There are in the South many large cast-iron-pipe works, which consume a large part of the product of Southern furnaces. The South, however, greatly

needs other industries which consume iron and steel, especially manufactories of railroad cars, wagons, plows, shovels, hoes, stoves, and all kinds of agricultural and other machinery.

At the close of 1901 there were in the whole country 527 completed rolling mills and steel works, not counting abandoned plants, twenty-eight building and one rebuilding. Of the whole number completed, fifty were in the nine Southern States, as follows: Twelve in Alabama, six in Virginia, three in Tennessee, six in Maryland, twelve in West Virginia, nine in Kentucky and two in Georgia, while one rolling mill is being built in West Virginia and one in Kentucky. There are no active rolling mills in Texas today, and no rolling mills at all in North Carolina, nor has either of these States now an active steel plant of any kind.

The resources of the South for the continued production of pig-iron on a large scale are ample. Taking the South as a whole, there is no scarcity of either iron ore or of good coking coal. Until recently it has been supposed that the South could never become a great steel producer, as it possesses but little iron ore that will make pig-iron suitable for conversion into acid Bessemer steel, which is the only kind of Bessemer steel that is now made in the United States. Such pig-iron of this quality as is now used at Baltimore, Wheeling and Ashland is made wholly from imported ores or from Lake Superior ores. But the rapid development in late years of the basic open-hearth steel industry in this country has not only furnished a market for large quantities of Southern basic pig-iron, for the manufacture of which large deposits of Southern ore are especially adapted, but it has encouraged the embarkation of capital in the manufacture in the South of basic open-hearth steel itself, the best fruits of which important innovation we now see at Ensley, Ala. All in all, the outlook for the iron and steel industries of the South is remarkably bright. The critical period of experiment, doubt and poverty of capital has passed.

Philadelphia, January 1, 1902.

West Virginia Coal and the World's Industry

By EX-GOVERNOR WILLIAM A. MacCORKLE

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As the United States has permanently entered the world's markets, let us briefly consider whether or not West Virginia is a component and absolutely necessary element in our country's attempt to master the trade of the world. In this necessarily brief discussion I will not more than mention West Virginia's magnificent area of hardwood timber, now being shipped to the markets of the world, and I will only allude to her rivers of oil, winding and twisting themselves beneath her surface, making her the greatest producer of high-grade crude oil in the world. Nor will I discuss the possibilities of her splendid beds of rich iron ores. Rather will I speak to one vital element of commerce, and that is coal and its successful competitive production.

WILLIAM A. MacCORKLE.

What will be West Virginia's portion in the national growth, foreign as well as domestic? In order to intelligently discuss this question let us for a moment consider the coal production of the world, its markets and the respective abilities of the different countries to supply the world's coal trade. England is no longer mistress of the world's coal market. Already her miners are more than 2000 feet beneath the surface, working in a two-foot vein, striving to furnish the comparatively diminishing product for herself and for the world's markets. She is losing her foreign trade. Her Mediterranean trade is today being vigorously contested, and day by day it is more apparent that her supply of coal will not suffice for the markets which she has heretofore absolutely controlled. More than that, the commercial conditions of the day will not longer allow her the pre-eminence which she has heretofore enjoyed in the sale of her coal product. Well do I remember when a speed trial could not take place without Welsh coal, but only last week I saw a shipload of Kanawha coal bound for the wharves at Liverpool.

West Virginia can today place coal in the West Indies, 2000 miles from her mountains, more cheaply than can Great Britain locate coal in the city of London. Therefore, I consider it self-evident that England's competition with us is a largely lessening factor. The commercial conditions of today make this condition inevitable.

Russia and China are not yet factors in the production of coal, and notwithstanding the great discoveries of coal in the empire of China, the commercial and competitive value of this product in these empires will not for a long time be a factor in the world's progress. It costs Japan, notwithstanding her cheap labor, twice as much to place coal at the pit mouth as it does in the State of West Virginia. This country cannot compete with the American product in the world's markets. France is year by year more largely importing coal; so with Italy, and such is the case with Germany; and it is not possible in either one of these countries to increase the production of coal for a foreign market. Each one of these countries, in the desperate fight for the commerce of the world, is demanding more coal for domestic use, and each one must have it in greater quantities to support their teeming and increasing millions of population. They are thus becoming our best markets, and are lessening in their ability to compete. The Mediterranean, situated in the midst of the commerce of the world, will be almost an undisputed field for our cheap coal products. South and Central America and the great Pacific coast are only awaiting the joining of the waters to feel that expanding industrial life and governmental constancy which will surely come with the advantages arising from the cheap and comparatively free use of the first element of modern industrial life, cheap fuel. The world today is taking an industrial advance, and whilst we know not its cause, we surely see its effect.

Then, where is the coal supply to come from for the world's needs, and who can most cheaply and quickly supply that need? It must come from the United States. This proposition cannot be disputed. Let us then consider what part of the United States can more easily and more cheaply supply this need of the world for the first element of industrial life. The State which will surely hold this great commercial position must combine the cheapest cost of mining with the best product, the most of it, and the lowest cost of transportation. West Virginia excels any competitor in any one of these requisites of success. Pennsylvania and Maryland are at the top of their bent in production, and they can only furnish a limited supply for the outside world's markets. In Maryland the field is limited, and every pound of coal that she can produce will be demanded by nearby consumption. Pennsylvania has a peculiar condition staring her in the face in reference to the production and sale of coal to the world's markets. She is the seat of the chief iron industry of the United States, and she cannot spare for foreign export coal which she herself must soon need in order to keep her own domestic industries alive. These conditions are perceptibly growing. With the immense manufacturing industries in her midst, for Pennsylvania to open her mines to the markets of the world and sell her reserved coal to that market would be to give an able-bodied man bread to eat and sell away from him every scrap of meat. The wise men of Pennsylvania well understand this condition, and are actively buying and jealously guarding her reserve coal territory in order that her manufacturing industries may not in the near future be starved for want of a cheap fuel supply. This statement is intensified when you appreciate that Pennsylvania has only 8000 square miles of coal, and the world has been industriously depleting that supply for more than a half-century. This depleted area of 8000 square miles is to be considered, for the purposes of this discussion, as against the 16,000 square miles of almost virgin West Virginia territory.

Ohio and Kentucky are from 100 to 300 miles farther from the eastern coast than are the coal fields of West Virginia. Every pound of Ohio coal is needed for the Lake and the Western trade and for her own immense industries. Ohio cannot compete with West Virginia by rail to the East, and her coals near the water transportation of the Ohio river cannot compare with West Virgina coal in quality. Kentucky cannot, except along the Ohio river, and then only in limited instances, ever contest with West Virginia in the foreign trade. The coal of only a limited portion of the Southern States, for the obvious reason of the long freight haul, can ever compete with West Virginia in that trade, and, as a matter of fact, none of the Southern coal can compare with the coals of this State in the purity of quality.

This State is permeated by great rivers, where from the very mines themselves can be filled the barges whose ultimate destination is the mouth of the Mississippi river. We have no great industries demanding all of our products, nor would it be possible to place in West Virginia's mountains and valleys sufficient manufacturing industries to consume more than a modicum of her coal product. She is downhill to Newport News, Norfolk and Baltimore, and is the cheapest coal-producing country adjacent to these respective ports. She controls the cheapest railroad traffic in this country. She is situated where she can reach the broad Ohio and Mississippi, which rivers can more cheaply than any railroad traffic in the world carry her product to the eastern coast and to the mouth of the Mississippi, which port will inevitably become the great maritime coal-loading port of the world.

The Kanawha river transportation is today the cheapest in the world. These conditions are apparent to the silent and almost grim giant who is guiding the destiny of the Pennsylvania Railroad Co., and whose strong hand has welded into that system the great soft-coal-carrying roads of West Virginia. This condition is doubly apparent to the young genius of the Wabash system, and today in the mountains of West Virginia there is a fierce battle of the industrial giants for the product of the West Virginia mountains.

Suppose that Pennsylvania could make an increase of coal production for the foreign trade. She is West Virginia's only great competitor in any trade. She alone has the coals which in purity can compete with West Virginia in either domestic markets or in the markets of the world. Can she successfully compete with the young daughter of the Old Dominion? Let us see.

In almost every instance West Virginia's fields are nearer the seacoast market, by reason of the cheap railroad transportation, than are the Pennsylvania fields. In almost every case our coals are more cheaply mined. West Virginia today—and I challenge contradiction of the statement—mines coal more cheaply than does any other section of the globe. In every instance our lands are from four to fifty times cheaper than those of Pennsylvania. Our mines are near daylight, whilst those of Pennsylvania are, in most in-

stances, miles under ground. Our available untouched coal area is fifty times greater than that of similar territory in Pennsylvania. These propositions apply largely to railroad transportation; but with the growing improvement of the Mississippi and Ohio rivers, those great arteries of cheap commerce, Western Pennsylvania cannot compete with West Virginia in the marketing of the coal. The Mississippi and Ohio rivers, in connection with the Nicaragua canal, will largely control the coal commerce of the Pacific coast, South and Central America, and largely of the West Indies, and will affect tremendously the strictly foreign trade. The Pacific, South American and West Indies trade will become among the most important of the globe. West Virginia is 300 miles nearer these markets than is the nearest coal field of Pennsylvania. The tides in the Ohio river for West Virginia are 255 days in the year, as against 155 days in the upper Ohio for Pennsylvania. That means delay for Pennsylvania and a market for West Virginia. It means an increase in the cost of ultimate production for Pennsylvania and a decrease for West Virginia, and one cent a ton means a competitive loss in the close-cut conditions of the world's market. It costs the Pittsburg operator twenty-five cents a ton more than it costs a Kanawha operator to land his coal at the mouth of the Mississippi river.

When looking back on the setting sun of past days some consider that the golden days of these mighty rivers were when the white palaces raced up and down their proud bosoms. Such might be the poetic fancy, but it is not the practical truth. The other day while I was standing on the bank of the Ohio river in the short space of thirty minutes there passed me three fleets of Kanawha coal, worth ten times the floating palaces of other days. No railroad can compete with this cheap river transportation, and I reiterate that the State or section which can deliver coal more cheaply at the mouth of the Mississippi will largely control the great markets of South and Central America, the West Indies and the Pacific coast. It will ultimately be one of the great loading places for the great European trade. The glory of New Orleans will not linger longer around that sentiment which clings to her broken porches and her overthrown homes, but it will be brightest when that city becomes the great unloading port for coal to be transported from the mouth of her mighty river.

Let it not be understood that this argument for the future power of West Virginia in the world's commerce is to be predicated alone upon this water transportation. Her situation in the midst of the great industrial region, twelve hours' run to the coast, with largely a downhill-grade railroad haul to the great Middle Atlantic ports, leaving out all question of water transportation to the Gulf of Mexico, will alone make West Virginia the most potent factor in this world development.

If these propositions are true, and West Virginia can more cheaply and easily reach the world and grasp in her strong hands these world-wide markets, has she the power in number of acres, breadth of field and purity of product to hold them within her grasp? In 1873 she mined 600,000 tons of coal. In 1901 she mined 25,800,000 tons of coal, a progress unparalleled in the history of coal production. This statement must be considered with the full understanding that this immense progress was made when the coal that was produced by her was mined practically for American domestic use. Today, with the conditions changed, with the widening markets of the world at hand, with the growth of the strong industrial Americanism which is pushing its commercial conquests to the Orient and the Occident, West Virginia's progress in the immediate future will outshadow and outclass her progress when she produced for the comparatively limited markets in this country.

To show her future power of production, will you pardon two or three illustrations as to West Virginia's developed conditions and her undeveloped possibilities. I write in the midst of the great Kanawha field. Its product last year was about 1,650,000 tons, and this product was taken from an active area of about 100,000 acres. Of my own knowledge I know lying in the midst of this great Kanawha field 850,000 acres of splendid undeveloped reserve coal, the equal of any now making this field so famous. This vast undeveloped area lies in virgin silence, and has never heard the ring of the miner's pick nor the sound of escaping steam. The cheap and productive capacity of this field is only limited by its ability to obtain barges, railroads, steamboats and more widely extended markets.

As I look across the Great Kanawha river my eyes fall on the rich territory of the Coal River valley, with 400,000 acres of territory bearing within its bosom the richest coals of commerce. From this basin of exhaustless plenty not a bushel has ever reached the market. Such is the case with the magnificent territory of the Elk valley, the Guyandotte and the Gauley, all lying within this immediate field. From this, my own Kanawha field, holding only a modest place with the great Fairmont, New River and Flat-Top fields, there was produced last year about 1,650,000 tons; and in this richest territory there is untouched enough coal to supply for years the markets of this country.

Pardon another illustration. I am only giving as illustrations this immediate field with its possibilities. I am not discussing the great Flat-Top, the Fairmont, the West Virginia Central and other great fields in West Virginia; it would take too much space; but in every one of these fields the propositions which I make as to the Kanawha and the New River fields are more than intensified. The New River territory last year produced about 4,000,000 tons of coal from about 100,000 acres of active territory. Within the very heart of that field, with its mighty production of last year, there are 865,000 undeveloped acres which are sufficient in volume and in richness of quality to supply, without great increase in equipment, the present output of the whole State of West Virginia. Fayette, Raleigh, Kanawha and Boone, four counties of the New River and Kanawha fields, carry about 14,250,000,000 tons of coal. These coals, at the current rate of production, will last 200 years. The world's product in 1899 amounted, in round figures, to 800,000,000 tons. The State of West Virginia can produce this world product of 800,000,000 tons for sixty-four years without touching a seam of less than three and one-half feet in thickness. West Virginia is now producing about 10 per cent. of the bituminous tonnage of the United States. Every railroad in the State is strained to carry the tonnage, and every water craft on the Ohio and Kanawha rivers is in constant service.

If these propositions as to quantity of coal and nearness to the world's markets are well taken, and I believe they cannot be shaken, the quality of West Virginia's product will immensely strengthen this State as a most potential factor in the nation's foreign commercial growth. How does she stand as to quality?

In this favored State, saving anthracite, there is every class of coal, and the best of the class. It is the standard for government vessels in the making of steam. It is the equal in every respect, and the superior in some, of the Welsh coal. It is unsurpassed in the making of coke. Our coke is more economical as an ironmaker than the Connellsville product. It will stand shipment beyond any known coal, and it is not deteriorated by exposure to climate or by heat and dampness in the hold of a vessel. It does not generate spontaneous combustion, and creates only a modicum of smoke. As a domestic coal it is surely driving out the anthracite in our great cities, and as a smithing coal it is eagerly sought for as the best.

There is not a condition demanded by the users of a high-priced product which is not satisfied by the magnificent coals of the West Virginia mountains. I am stating known conclusions, fully arrived at by laborious investigation and wide experience, and do not wish to load this brief statement with a tabulation of proofs, which, however, are ready at hand. There is only one State in the Union which can in anywise compete with West Virginia in the quality of coal, and that is the State of Pennsylvania. Today West Virginia is shipping its coal directly through the great Hocking field, and our coal is mined 200 miles further away from the market than is the Ohio product.

If these statements are true, in that great distribution of coal, the essential element of commerce, who can compete with the mighty daughter of the Old Dominion? Not one!

I wish that my space was broader in order that I might further pursue this interesting discussion, and show more absolutely my conclusions that in the question of the coal production within the next few years the most potent factor in the United States will be the State of West Virginia. She is a component and absolute necessity for the development of the world's trade, and without hesitation I say that within the next few short years she will be the strongest and most potent factor in the manufacturing interests of the globe.

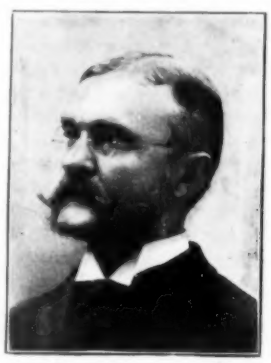
William A. MacCorkle

The South's Resources Hardly Touched

By CHARLES A. SCHIEREN

of Chas. A. Schieren & Co., New York

It was largely due to an article appearing in your valued journal many years ago that we located a tannery in the South. That article drew our attention to the abundance of tanning material still undeveloped to be had in the South, consisting principally of prime chestnut-oak bark, found in the limestone regions of the mountainous districts of Virginia, Tennessee and North Carolina. After careful investigation, we selected Bristol, Tenn., as the best-suited place, and erected the Dixie Tannery, which now ranks as one of the leading plants of its kind in the South.



CHARLES A. SCHIEREN.

Nowhere has enterprise and push made greater progress than in Bristol and vicinity. Its success is an evidence of the growth and development throughout the South. That entire section of the country along the Norfolk & Western Railroad has had a marvelous growth within the last decade. Large manufacturing establishments have been erected, enormous iron, coal and other mines opened, great steel and iron furnaces started, which, along with the naturally fertile soil, has enriched the people and brought universal prosperity.

The interests of Bristol increased wonderfully since we founded our tannery, which is now nearly ten years ago. Several extensive saw and lumber mills, axe-handle factories, large paper-pulp mills and various other smaller plants have been started. These, with the large furnace, steel and iron industries, are bound to make Bristol in the near future one of the most active and prosperous cities in the South.

Bristol needs better railroad terminals. Although several large railroads terminate there, no adequate accommodations are provided for the traveling public. It should also have a first-class, up-to-date hotel with modern improvements and accommodations for business and traveling men. This is an absolute necessity for a progressive, enterprising town. The railroads should extend their freight facilities for handling the constant increase of freight for its growing industrial plants.

But Bristol is not the only city which has prospered in the South. Everywhere we learn of great manufacturing concerns being started. The business, financial and enterprising men of this country commence to realize the won-

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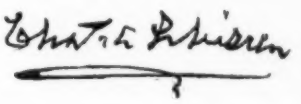

The South As Seen Through English Eyes

By J. STEPHEN JEANS of London,

Secretary British Iron Trade Association

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Thirty years ago an old and esteemed friend of mine wrote a book in which I was greatly interested, but which is probably now almost forgotten. The friend was Mr. Robert Somers of Glasgow, well known in British newspaper circles as editor of the Morning Journal of that city. The book was entitled "The Southern States Under Reconstruction." It appeared about the year 1870, and gave a vivid, and in some respects eloquent, account of the terrible condition in which the South found itself at the close of the war, and of the laborious exertions that had been made in the short interval that had since elapsed to become rehabilitated in its march from poverty to progress.

J. STEPHEN JEANS.

It has been my fortune on many occasions since then to meet Southern gentlemen, from whose lips I have heard graphic descriptions of the hardships and the sufferings they have endured and the struggles they have been called on to make as a result of that great conflict. Among those friends I would particularly name Mr. John C. Calhoun and his brother, Mr. Patrick Calhoun, both well known in connection with the old Richmond Terminal system of railways, and both distinguished alike as grandsons of one of the most able publicists that the South has ever produced, and for their own conspicuous part in many Southern enterprises of the last twenty years. Both at his own house in New York and at my house in London, I have heard from the lips of Mr. John C. Calhoun particulars of the slough of despond into which his family, in common with that of most other Southern planters, had been plunged by the war, and of the infinite patience, endurance and energy with which the worst and most immediate consequences of that sad and desolating period were overcome.

Once again, in the year 1890, when as secretary of the Iron and Steel Institute it became my duty to arrange for the visit of more than 300 British members of that technical organization, and incidentally of nearly 150 members of the *Vercin Deutscher Eisenhüttenleute*, to the United States and on American soil, in conjunction with my good friends, Mr. Charles Kirchoff, Mr. John Birkinbine, Dr. Rossiter W. Raymond and others, to organize transport for the visit to the Southern States of what was probably the largest body of Englishmen and Germans that had ever proceeded thither as a visiting party, I came into contact with many gentlemen who held more or less prominent positions in the Southern States, and who were able to tell me, and did tell me, much concerning their resources, their achievements and possibilities.

These things are mentioned merely for the purpose of showing that the progress and potentialities of the South is not with me an entirely new subject; that the future of the South has been the center of a group of social and economic problems in which I have long taken a deep interest, and that it is natural, and perhaps inevitable, that that interest should have been greatly stimulated by my recent visit to Alabama, Tennessee and Georgia, to which I apprehend I owe it that you have been so polite as to invite me to make a contribution to your excellent journal, the Manufacturers' Record.

The range and scope of this subject, however, are so vast that it can only be that I should give you in a short article such as this must be a few general impressions, founded more or less on particular facts.

The point of these impressions is that the South would have made infinitely greater progress than it has done had it enjoyed the same resources of energy, enterprise and available capital as the North. The whole of the territory of the United States is richly endowed with natural resources, but I know of no section with its cup of blessings fresh from nature's hand so overflowing as the Southern States, which have not only gold, lead, copper, iron, coal and other minerals, but which in respect of agricultural products, including cotton, are at least equal to, if they do not exceed, any equally large area of the earth's surface with which I have made acquaintance in the course of very considerable travels on four continents.

Quite recently I took occasion to consult a report on the Centennial Exhibition written by Sir Lowthian Bell, a colleague for more than sixteen years in the Iron and Steel Institute. This report shows that in 1876, when the iron industry of the South was comparatively young, that authority was greatly struck with its iron-making resources. He estimated the capacity of the principal States then to be:

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At that time the same authority computed that the cost of assembling the materials for a ton of pig-iron in the Southern States—in Alabama—was 9/6, or little more than $2 per ton, whereas it was then 35/3 in Pittsburg, 36/ in Cleveland and 46/6 in Chicago. In speaking in his report of the ironmaking resources of Alabama, Sir Lowthian found them so remarkable that he had almost to apologize for stating the facts, adding that "to an English ear this language may bear the impress of exaggeration." Even at that time the situation was practically summed up in the words, "the South first; the rest nowhere."

Twenty-six years later, how do the Southern States compare with those of the North and Center? In the interval the total ironmaking capacity of the United States has grown from a little over 5,000,000 to probably 16,000,000 or 17,000,000 tons, while the actual pig-iron output has grown from a little over 2,000,000 to about 15,000,000 tons. In the Southern States, however, the total output does not now much exceed 2,000,000 tons, or, say, one-seventh of the whole make of the republic.

To an outsider, even though tolerably well acquainted with the usual phenomena which attend and explain the more or less apparently capricious development of ironmaking resources in rival localities, it must appear a profound puzzle that the great iron industry of the United States should have been chiefly founded, as it has, on transporting to a common center iron ores from distances varying from 950 to 1050 miles, and coal and coke from a distance varying from thirty-five to sixty miles, when in another and not greatly distant or inconvenient section of the same country the raw materials are found, and in conjunction with at least nominally cheaper labor, within a radius of six or seven miles, while in some localities they are still closer together. This becomes all the more a conundrum when it appears that in the South the cost of producing pig-iron is admittedly cheaper than in any other locality within the wide folds of the United States, and can possibly be brought down to a figure that would make it cheaper than that of any locality in the world.

Why, then, has the South been more or less neglected? It can hardly be because the advantages and resources of these States have not been made known, because this, to my knowledge, has been done, and done well for many years by the Manufacturers' Record, and by other media. I had occasion some years ago to have several consultations with the late Duke of Marlborough—who took a great interest in the South and paid several visits to Kentucky and other parts of it—as to the value of Southern properties as an investment for British capital. The Duke had then been looking into some Southern properties that had been brought to his notice by my friends, Mr. Abram S. Hewitt or Mr. John C. Calhoun, or both, and thought well of them. But he was choked off on the question of titles. I have heard of several similar cases. The South will probably continue to make progress more slowly than it would be likely to do if it had a system whereby an indefeasible title could be given at once and forever to every property in the market; but when the rights of meum and tuum are liable to be contested over every small property, and endless and costly litigation is threatened where nothing of the kind, in all probability, was ever dreamt of by the buyer, one cannot wonder that capitalists fight shy. The most splendid investment otherwise that the world can offer would be dear at a price that involved endless worry, uncertainty and distraction, as some investments in Southern property have done from this cause.

There has been another bar sinister in Southern industrial affairs. The men that have gone South to found industries have not always had a zeal according to knowledge. Industries have been founded in the most unsuitable localities, and they have been started by men who were more or less unfamiliar with their technical details and requirements. This is not an experience peculiar to the South. In all phenomenally progressive localities, which make history perhaps too quickly to be able to choose the right men for the right place, and must, too, often make a virtue of necessity, the "notoriously substanceless bummer" described by Mark Twain, the mere adventurer, the Jack of all Trades, and the inexpert expert are to be found. Every new community must become purged by a process of natural selection. If the South

stances, miles under ground. Our available untouched coal area is fifty times greater than that of similar territory in Pennsylvania. These propositions apply largely to railroad transportation; but with the growing improvement of the Mississippi and Ohio rivers, those great arteries of cheap commerce, Western Pennsylvania cannot compete with West Virginia in the marketing of the coal. The Mississippi and Ohio rivers, in connection with the Nicaragua canal, will largely control the coal commerce of the Pacific coast, South and Central America, and largely of the West Indies, and will affect tremendously the strictly foreign trade. The Pacific, South American and West Indies trade will become among the most important of the globe. West Virginia is 300 miles nearer these markets than is the nearest coal field of Pennsylvania. The tides in the Ohio river for West Virginia are 255 days in the year, as against 155 days in the upper Ohio for Pennsylvania. That means delay for Pennsylvania and a market for West Virginia. It means an increase in the cost of ultimate production for Pennsylvania and a decrease for West Virginia, and one cent a ton means a competitive loss in the close-cut conditions of the world's market. It costs the Pittsburg operator twenty-five cents a ton more than it costs a Kanawha operator to land his coal at the mouth of the Mississippi river.

When looking back on the setting sun of past days some consider that the golden days of these mighty rivers were when the white palaces raced up and down their proud bosoms. Such might be the poetic fancy, but it is not the practical truth. The other day while I was standing on the bank of the Ohio river in the short space of thirty minutes there passed me three fleets of Kanawha coal, worth ten times the floating palaces of other days. No railroad can compete with this cheap river transportation, and I reiterate that the State or section which can deliver coal more cheaply at the mouth of the Mississippi will largely control the great markets of South and Central America, the West Indies and the Pacific coast. It will ultimately be one of the great loading places for the great European trade. The glory of New Orleans will not linger longer around that sentiment which clings to her broken porches and her overthrown homes, but it will be brightest when that city becomes the great unloading port for coal to be transported from the mouth of her mighty river.

Let it not be understood that this argument for the future power of West Virginia in the world's commerce is to be predicated alone upon this water transportation. Her situation in the midst of the great industrial region, twelve hours' run to the coast, with largely a downhill-grade railroad haul to the great Middle Atlantic ports, leaving out all question of water transportation to the Gulf of Mexico, will alone make West Virginia the most potent factor in this world development.

If these propositions are true, and West Virginia can more cheaply and easily reach the world and grasp in her strong hands these world-wide markets, has she the power in number of acres, breadth of field and purity of product to hold them within her grasp? In 1873 she mined 600,000 tons of coal. In 1901 she mined 25,000,000 tons of coal, a progress unparalleled in the history of coal production. This statement must be considered with the full understanding that this immense progress was made when the coal that was produced by her was mined practically for American domestic use. Today, with the conditions changed, with the widening markets of the world at hand, with the growth of the strong industrial Americanism which is pushing its commercial conquests to the Orient and the Occident, West Virginia's progress in the immediate future will outshadow and outclass her progress when she produced for the comparatively limited markets in this country.

To show her future power of production, will you pardon two or three illustrations as to West Virginia's developed conditions and her undeveloped possibilities. I write in the midst of the great Kanawha field. Its product last year was about 1,650,000 tons, and this product was taken from an active area of about 100,000 acres. Of my own knowledge I know lying in the midst of this great Kanawha field 850,000 acres of splendid undeveloped reserve coal, the equal of any now making this field so famous. This vast undeveloped area lies in virgin silence, and has never heard the ring of the miner's pick nor the sound of escaping steam. The cheap and productive capacity of this field is only limited by its ability to obtain barges, railroads, steamboats and more widely extended markets.

As I look across the Great Kanawha river my eyes fall on the rich territory of the Coal River valley, with 400,000 acres of territory bearing within its bosom the richest coals of commerce. From this basin of exhaustless plenty not a bushel has ever reached the market. Such is the case with the magnificent territory of the Elk valley, the Guyandotte and the Gauley, all lying within this immediate field. From this, my own Kanawha field, holding only a modest place with the great Fairmont, New River and Flat-Top fields, there was produced last year about 1,650,000 tons; and in this richest territory there is untouched enough coal to supply for years the markets of this country.

Pardon another illustration. I am only giving as illustrations this immediate field with its possibilities. I am not discussing the great Flat-Top, the Fairmont, the West Virginia Central and other great fields in West Virginia; it would take too much space; but in every one of these fields the propositions which I make as to the Kanawha and the New River fields are more than intensified. The New River territory last year produced about 4,000,000 tons of coal from about 100,000 acres of active territory. Within the very heart of that field, with its mighty production of last year, there are 865,000 undeveloped acres which are sufficient in volume and in richness of quality to supply, without great increase in equipment, the present output of the whole State of West Virginia. Fayette, Raleigh, Kanawha and Boone, four counties of the New River and Kanawha fields, carry about 14,250,000,000 tons of coal. These coals, at the current rate of production, will last 200 years. The world's product in 1899 amounted, in round figures, to 800,000,000 tons. The State of West Virginia can produce this world product of 800,000,000 tons for sixty-four years without touching a seam of less than three and one-half feet in thickness. West Virginia is now producing about 10 per cent. of the bituminous tonnage of the United States. Every railroad in the State is strained to carry the tonnage, and every water craft on the Ohio and Kanawha rivers is in constant service.

If these propositions as to quantity of coal and nearness to the world's markets are well taken, and I believe they cannot be shaken, the quality of West Virginia's product will immensely strengthen this State as a most potential factor in the nation's foreign commercial growth. How does she stand as to quality?

In this favored State, saving anthracite, there is every class of coal, and the best of the class. It is the standard for government vessels in the making of steam. It is the equal in every respect, and the superior in some, of the Welsh coal. It is unsurpassed in the making of coke. Our coke is more economical as an ironmaker than the Connellsville product. It will stand shipment beyond any known coal, and it is not deteriorated by exposure to climate or by heat and dampness in the hold of a vessel. It does not generate spontaneous combustion, and creates only a modicum of smoke. As a domestic coal it is surely driving out the anthracite in our great cities, and as a smithing coal it is eagerly sought for as the best.

There is not a condition demanded by the users of a high-priced product which is not satisfied by the magnificent coals of the West Virginia mountains. I am stating known conclusions, fully arrived at by laborious investigation and wide experience, and do not wish to load this brief statement with a tabulation of proofs, which, however, are ready at hand. There is only one State in the Union which can in anywise compete with West Virginia in the quality of coal, and that is the State of Pennsylvania. Today West Virginia is shipping its coal directly through the great Hocking field, and our coal is mined 200 miles further away from the market than is the Ohio product.

If these statements are true, in that great distribution of coal, the essential element of commerce, who can compete with the mighty daughter of the Old Dominion? Not one!

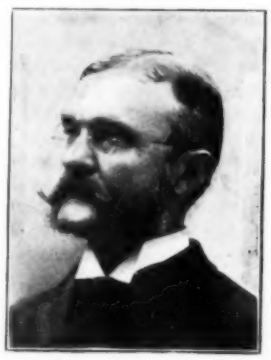
I wish that my space was broader in order that I might further pursue this interesting discussion, and show more absolutely my conclusions that in the question of the coal production within the next few years the most potent factor in the United States will be the State of West Virginia. She is a component and absolute necessity for the development of the world's trade, and without hesitation I say that within the next few short years she will be the strongest and most potent factor in the manufacturing interests of the globe.

William A MacCorkle

The South's Resources Hardly Touched

By CHARLES A. SCHIEREN
of Chas. A. Schieren & Co., New York

It was largely due to an article appearing in your valued journal many years ago that we located a tannery in the South. That article drew our attention to the abundance of tanning material still undeveloped to be had in the South, consisting principally of prime chestnut-oak bark, found in the limestone regions of the mountainous districts of Virginia, Tennessee and North Carolina. After careful investigation, we selected Bristol, Tenn., as the best-suited place, and erected the Dixie Tannery, which now ranks as one of the leading plants of its kind in the South.



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Edward A. Atkinson

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By J. STEPHEN JEANS of London,

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Secretary British Iron Trade Association

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To an outsider, even though tolerably well acquainted with the usual phenomena which attend and explain the more or less apparently capricious development of ironmaking resources in rival localities, it must appear a profound puzzle that the great iron industry of the United States should have been chiefly founded, as it has, on transporting to a common center iron ores from distances varying from 950 to 1050 miles, and coal and coke from a distance varying from thirty-five to sixty miles, when in another and not greatly distant or inconvenient section of the same country the raw materials are found, and in conjunction with at least nominally cheaper labor, within a radius of six or seven miles, while in some localities they are still closer together. This becomes all the more a conundrum when it appears that in the South the cost of producing pig-iron is admittedly cheaper than in any other locality within the wide folds of the United States, and can possibly be brought down to a figure that would make it cheaper than that of any locality in the world.

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had had the advantage from the start of its modern industrial era of such capacity, enterprise and capital as have been at the disposal of the Pittsburg district, what a different record it would have had to day!

But until a district is found that can go one better, my idea is that the South can afford to wait. It has suffered from both its friends and its enemies, and it even yet requires to be protected from both. In the meantime, the natural resources of climate, soil and mineral wealth which it possesses do not, like the riches of some more mushroom districts, or places built on more artificial foundations, threaten to "take wings." If they cannot be utilized with advantage and profit today, they can keep, and in the process of keeping their value will increase. There are not many Alabamas in the world; there is no other in the United States. In some degree the same remark applies, mutatis mutandis, to other ironmaking centers of the South. If I were seeking an investment for my children or for myself, if I had been a young man, I think I would vary Horace Greeley's injunction and "Go South."

J. Stephen Jeans

Southern Petroleum and the Fuel Market

By C. F. Z. CARACRISTI, C. E., E. M.

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The initial year of the present century has been one of great, though at times scattered and unscientific, development in the petroleum possibilities of the South. I mean that the phenomenal record in petroleum development has been more the result of unlimited expenditure than of conservative, scientific investigation, and that the vast accumulation of uninvested capital, both in individual purses and the strong vaults of powerful banking institutions of the country, has been the prime instigator in the unfolding to the world of the unlimited possibilities of the South and Southwest as oil producers. The tide of oil speculation in the South is mainly due to the memorable achievement of Capt. A. F. Lucas, and without his first great gusher as a stimulus to activity this section would today be in the same position as a petroleum factor as at the end of 1900. Today's success is merely the result of necessity in industrial development—the meeting of a great event and a great man at a time when the country's wealth made it possible to accomplish rather than simply hope. I speak of this fact because over half a century ago the scientific world was startled by the outbreak of a gusher in Kentucky, but outside of its position as a natural phenomenon it attracted no special attention. The time had not arrived when the hand of man should harness this seemingly inoffensive force originating from the sun's rays millions of years ago and use it to his own benefit and the glorification of the Eternal Architect.

C. F. Z. CARACRISTI.

Perhaps no man has done more in his humble way to show up the possibilities of Southern petroleum before it was developed than I, and again, no man has done more to point out the folly of overestimating its possibilities after it had become a factor in the world's petroleum stock market—not that I do not acknowledge values as they actually exist, and weigh them on the balance of actual worth, but because I do not believe that any one point should attract undivided attention to the injury of the territory at large. Outside of Spindle Top there are great possibilities in Texas, Louisiana, Mississippi, Alabama, Florida, Arkansas, Tennessee, Kentucky, and I believe that some years ago I saw promising indications in Southwestern Virginia near Bristol, as well as in Southeastern North Carolina.

As phenomenal as the Spindle Top property has been in making up the Texas statistics for 1901, I am gratified to note the progress of the Corsicana field: Corsicana shipped 1,016,542 barrels, at an average value of seventy cents per barrel; Spindle Top shipped 1,502,968 barrels, at an average value of twenty cents per barrel. This gives Corsicana a gross income of $711,579.40, and Spindle Top $300,593.60.

The above is somewhat misleading, as I have not taken into account some 70,000 barrels of oil used on the ground at Spindle Top, nor have I considered about 2,000,000 barrels in storage at Beaumont and Port Arthur, owing to the fact that I am considering only actual sales. The total production at Spindle Top for 1901 was 4,202,968 barrels of oil, which, together with the Corsicana, gave Texas a production of 5,219,510 barrels. This does not include the oil wasted in attempts to control wells.

The Louisiana field, which is under deveopment, gave about 3000 barrels of oil, distributed between Jennings, Anse la Butte, Bayou Blue and Belle Isle. The eastern part of Louisiana, while offering remarkable surface indications of both petroleum and gas, will not for the present be a factor in either of these commodities, owing to the fact that so far no method has been devised by which to control the loose sand that is found throughout the territory, and the further fact that drilling is being done generally in unsuited locations by people not acquainted with the petroleum business. Failures in such events should not condemn the field or discourage investment.

From the data just received from the controlling pipe lines and petroleum companies of the United States and from independent producers, I find that the total petroleum production in the United States for 1901 was 64,568,988 barrels of forty-two gallons. The United States Treasury bureau of statistics, however, places the production for the same period at 66,000,000 barrels. From an examination of the figures it will be seen that the Texas oil field has given a little over 8 per cent. of the petroleum production of the United States during 1901, having risen from less than 2 per cent. in 1900 With proper transportation facilities during 1902 the Texas-Louisiana field should give 20 per cent. of the total petroleum production of the United States, even though Kentucky, Tennessee, and probably Indian Territory, will add their pro rata to the grand total. A remarkable condition in the petroleum production of the United States is the fact that in five years the production has gained only 3,608,627 barrels. Another interesting fact is that the petroleum production in 1880 was about equal to twenty-one gallons per capita, and that it has risen in 1901 to thirty-seven gallons. It is true that the petroleum product exports increased, but it is likewise a fact that many by-products that were thrown away in the past are used today.

With the increasing commerce of the ports of New Orleans, Galveston and Sabine Pass, and the southward movement of vast manufacturing enterprises, it should not be difficult to see a greater future for Southwestern petroleum and its products than the most visionary would have admitted ten months ago. As fuel, if the supply lasts and the oil is not refined, it will form the basis of a healthful growth in the country immediately surrounding the field, where the yearly manufactured products during 1901 reached nearly $400,000,000. The yearly fuel consumption within a 400-mile radius, taking Austin, Texas, as a center, is equal to 2,000,000 tons of Pocahontas coal, or equivalent to 8,400,000 barrels of Texas fuel petroleum. But the great question which confronts us is, will the Texas-Louisiana fields remain fuel-oil producers, or will the decrease in the Northeastern fields force Texas distillates on the foreign markets, either as competitors to Northeastern petroleum or mixed with it?

In my previous articles I have fully reviewed the financial and geological conditions of the Texas-Louisiana petroleum field, and will now discuss the actual value of the petroleum as a fuel and illuminating oil proposition, giving the results based upon actual returns. While some of this information may be somewhat technical, it will enable anyone desiring to use the petroleum as fuel to perceive its advantages without the necessity of applying for professional advice or depending on the statements of those who have liquid fuel for sale. I find the merchantable distillates of the Beaumont oil as follows:

Kerosene No. 1	10%	F. P. 123° F.
Kerosene No. 2	8%	F. P. 125° F.
Kerosene No. 3	7%	F. P. 127° F.
Lubricating oils	10%	
Light oils	2%	
Total available distillates	37%	

The flash-point of the oil varied in the several samples submitted to distillation and refining, some of the kerosene going as high as 135° F. P. The viscosity of the lubricating oil does not compare with Eastern oils.

Taking the distillates at their market value at the refinery, a barrel of Texas fuel oil is worth:

Average kerosene, 10.50 gallons, at 5 cents per gallon	$0.5250
Average lubricating, 4.20 gallons, at 10 cents per gallon	.4200
Average light oils, .84 gallon, at 12 cents per gallon	.1008
Total	$1.0458

Residuum, 26.46 gallons, worth for fuel purposes the same per gallon as before the light distillates were removed.

My experience in the Russian field has proved that with a normal market for liquid fuels it is often possible to sell the "astatki" that remains over from crude petroleum after distillation at the original purchase cost per barrel. In the Russian field, however, we only remove from 18 to 23 per cent. of distillates.

Efforts have been repeatedly made to use the residuum of petroleum in the manufacture of asphaltum, and to a certain degree the experiments have been successful, yet so far the feasibility of such an industry has not been commercially demonstrated. In some of my own experiments I have endeavored to add to the firmness of asphaltic residuum by a process of semi-combustion, but although I have been able to add to the hardness, yet the heat of the hand was always sufficient to melt the asphaltum enough to permit it to adhere to the skin; besides, the product would not stand the freezing and heat tests. The same condition is true of all other by-product asphalts made from petroleum, except a few laboratory samples that have little commercial value. However, I fully believe that diligent search will be able to utilize the Texas petroleum by-product in the production of commercially valuable asphaltum. I wish to admit, however, that there are uses to which the present manufactured product may be put other than the paving of streets, for which it is, in its present condition, wholly unfitted. Experiments in this direction will be of great benefit.

The value of fuel petroleum in the United States may have a significance so broad as to once more restore to this country a merchant marine adequate to our commerce and the clamorous demands of our home and territorial industries. The righful demand for a ship subsidy at a time when only 8 per cent.

of our foreign commerce is carried on American bottoms justifies us in setting forth every available means to assist shipping. I shall now demonstrate how fuel petroleum will assist the American merchant marine, assuming petroleum at sixty cents per barrel and Pocahontas coal f. o. b. bunkers at $3.80 per ton. For convenience, I shall estimate that we are dealing with a steamship of 13,000 tons displacement, 10,000 indicated horse-power, having an average speed of twenty knots per hour:

Cost of coal for round trip from New York to Southampton, 4500 tons	$17,100 00
Cost of petroleum, 20,520 barrels (equal 3352.05 tons)	12,312 00
Saving in cost	$4,788 00
Saving in tonnage 1147.9 tons, space worth $4 per ton	4,591 60
Total saving by use of crude petroleum fuel	$9,379 60

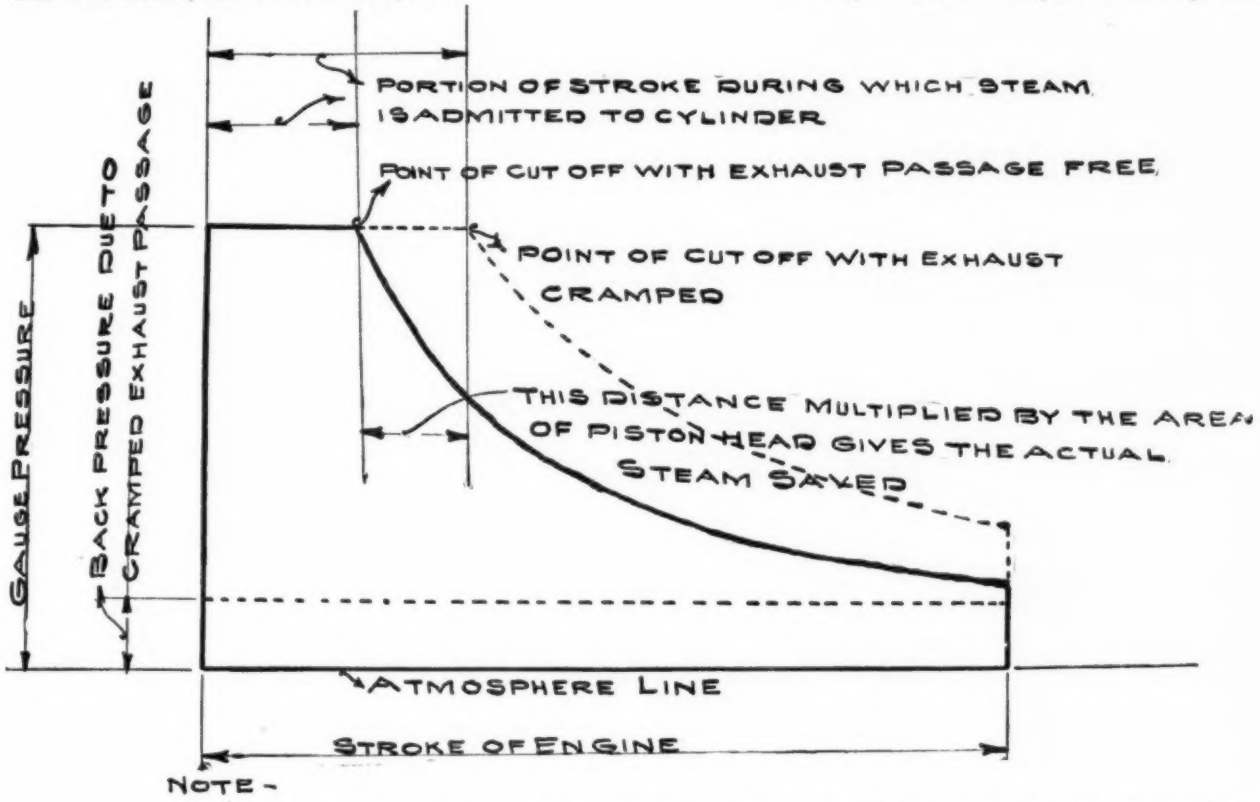
NOTE.—Texas oil as well as other petroleums can be sold f. o. b. Atlantic ports at sixty cents per barrel.

Again, there is to be considered that the labor of handling coal and ashes, as well as the laborious work of firing, is saved, to say nothing of the saving in steam and space in the operation of forced draft.

As transatlantic steamships average ten round trips from New York to Southampton or Liverpool per year, we have a saving of $93,796 per year, equal to a subsidy of $7.20 per gross register ton rating, which would enable American ships, if the petroleum output should be controlled in the United States only, to compete more than favorably with foreign ships, the owners of which are generally content with a less profit than the American investors. Of course, I do not infer by this that we should not help the American merchant marine, but I am only indicating wherein it can help itself by taking advantage of the opportunities offered it by the use of petroleum as fuel.

Another most important item in the value of Southern petroleum lies in its being such an ideal fuel in a locality where nature seems to have been content with giving great agricultural advantages, but hitherto lacking in the life of commerce in not having the necessary fuel for manufacturing and transportation purposes, making it necessary to give part of its riches for this necessity to outside sections.

The object of the following is to show in a comprehensive way the value of this petroleum compared with coal at the present prices and with a heating value of the ordinary run of the Alabama product.


PORTION OF STROKE DURING WHICH STEAM IS ADMITTED TO CYLINDER
POINT OF CUT OFF WITH EXHAUST PASSAGE FREE
POINT OF CUT OFF WITH EXHAUST CRAMPED
THIS DISTANCE MULTIPLIED BY THE AREA OF PISTON HEAD GIVES THE ACTUAL STEAM SAVED
GAUGE PRESSURE
BACK PRESSURE DUE TO CRAMPED EXHAUST PASSAGE
ATMOSPHERE LINE
STROKE OF ENGINE
NOTE -
AREA OF BOTH CARDS IS THE SAME AND CONSEQUENTLY THE MEAN EFFECTIVE PRESSURE IS THE SAME

Beginning with stationary plants whose boilers and engines are of the ordinary type, and with everything being equal, a comparison of the cost per horse-power per hour and per working day of ten hours, together with cost of installation of plant, is herewith given, enabling the actual saving to be seen at a glance.

Cost of steam plant per horse-power, based on comparative tests on 850 nominal horse-power plant:

	Coal.	Petroleum.
Cost of engine and piping complete	$19.50	$19.50
Engine-house	6.50	6.50
Engine foundation	6.00	6.00
Boilers complete	17.50	17.50
Boiler-house (covered by engine-house)	....	....
Stack	4.00	2.50
Total cost plant per horse-power	$53.50	$52.00
Depreciation, 7 per cent. on cost, per day per horse-power	.0102	.0099
Repairs, 3½ per cent. on cost, per day per horse-power	.0051	.00495
Interest, 5 per cent. on cost, per day per horse-power	.0073	.0071
Taxes, 1 per cent. on cost, per day per horse-power	.00146	.00142
Insurance, .5 per cent. on cost, per day per horse-power	.00073	.00071
Cost coal per horse-power per day, 4 pounds per horse-power per hour, coal at $5 per ton	.10	....
Cost petroleum per horse-power per day, 4 barrels petroleum equal 1 ton, petroleum at 60 cents per barrel	....	.048
Attendance of engine per day	.03	.03
Attendance of boilers per day	.075	.020
Oil waste and supplies per day	.027	.027
Total daily running expenses per horse-power	.25679	.14908
Total daily running expenses for plant	$218.271	$126.718
Saving in favor of petroleum per horse-power per day		$0.10771
Saving in favor of petroleum for plant per day		91.553
Saving in favor of petroleum per horse-power per annum		32.313
Saving in favor of petroleum for plant per annum		$27,466.05

On locomotives we find that petroleum overcomes one of the most important problems which has since the beginning of railroading been confronting their mechanical departments—that of proper draft. Taken at its best, a locomotive is a wasteful piece of mechanism, largely due to the fact that the limits as to size and weight imposed upon it by the tunnels, bridges and weight of rail, combined with the tendency to haul heavy trains at a high rate of speed, make it imperative that the boiler should be working to its full forced capacity, and to get draft enough to cause perfect combustion of the coal used as fuel it is necessary to force the draft by means of a vacuum caused by the sharp exhaust in the smokebox or front end of the boiler, together with an arrangement of deflector-plates, etc., with this end in view. One of the natural results of this throttling of the exhaust is that the work imposed on the boiler which it assists is increased, owing to the fact that it requires more steam to do the work, from the fact that this back-pressure in the cylinders must be overcome at each stroke, with that much dead loss of heat and fuel.

In the appended theoretical comparison of coal and petroleum as fuel for locomotives no attempt has been made to show the indirect saving of round-house work in the way of cleaning ashpans, loading and hauling away the ashes, loss due to the coal left to burn itself out at the end of runs, saving in not having boiler fronts and smokebox-plates burn out from cinders, and other minor considerations too numerous to mention; also the comfort of the traveling public in doing away with the smoke nuisance should not be overlooked. Taking these details into consideration, the railroads could afford to pay more money for petroleum, on a basis of its heating value, than for coal, and still show a saving for the monthly statements.

Without going into technical details in relation to the heating value of the coal used in comparative test, it is sufficient to say that this coal has a value of 13,500 in British thermal units per pound, which gives an ultimate available heating value of 686,340,000, while the amount turned into actual work as shown by the water consumption and average steam pressure is represented by the amount of heat necessary to raise 255,640 pounds of water from 40° F. to 368.2° F., or 1193.6 B. T. U. per pound of water, a total of 305,131,904 B. T. U., showing a boiler efficiency of 44.4 per cent. With the same conditions, using petroleum as fuel, an efficiency of 55 per cent. can be obtained, through the fact that combustion is practically perfect, and the loss through unconsumed gases escaping through the stack is reduced to a minimum, while at the same time the fire would be perfectly under the control of the fireman, which is not the case with coal.

Taking into consideration the saving in steam consumption in the cylinders for the reasons above given, and with a boiler efficiency of 55 per cent., it will be necessary to have an available heat of 521,399,200 B. T. U., which, divided by 19,600 B. T. U., the value of petroleum per pound, shows that in this case 26,602 pounds of petroleum will do the same work as 50,840 pounds of coal with a value of 13,500 B. T. U.

	Actual. Coal.	Theoretical. Petroleum.
Distance run in miles	500	500
Weight of train, tons	186	186
Time of test, hours	12.56	12.56
Average speed, miles per hour	39.8	39.8
Fuel used, pounds	50,840	26,602
Water used, pounds	255,640	240,280
Efficiency of boiler	44.4%	55%
Available heat units (B. T. U.)	686,340,000	521,399,200
Heat used (B. T. U.)	305,131,904	286,769,560
Average temperature feed water	40° F.	40° F.
Average steam pressure	169 lbs.	169 lbs.

Pounds water evaporated per pound combustible	5.06	9.03
Equivalent evaporated from and at 212° per pound combustible	6.23	11.11
Weight of ashes, pounds	3,783	.....
Per cent. of ashes	9.72	.....
Per cent. of moisture	7.32	.....
Total per cent. moisture and ashes	17.04	.....
Cost of fuel	$4.30 ton.	$0.60 bbl.
Cost of fuel for run	$109.30	$48.96
Heat value of fuel in B. T. U	13,500	19,600
Pounds of combustible per ton mile	.568	.283
Pounds of combustible per train mile	101.7	53.2
Cost of combustible per ton mile	$0.00122	$0.00052
Cost of combustible per train mile	.218	.0978

NOTE.—Figure given for per cent. of ash in coal is from a practical standpoint only, as it contains unconsumed coal, and should not be used as the actual figure, which is .64 per cent. Coal test made under direction of Mr. Charles Linstran, M.E., Chicago & Alton Railroad, and others.

To show graphically where the chief advantage is in the use of petroleum as fuel on locomotives, in allowing the wasteful practice of getting forced draft at the expense of the steam consumption by throttling the exhaust so as to get a sharp exhaust through the smokestack, thereby creating a vacuum in the front end which must be filled through the firebox to be eliminated, the above ideal indicator cards are given, the card in full lines being ideal in every respect, and the card shown in dotted lines being ideal in everything with the exception of the back-pressure line.

As the work done by the engine is represented by the *average* pressure during *full* stroke, and as the stroke is the same in both cases, it can be seen at a glance that if the *area* of the cards remains the same, the result must be the same also, irrespective of the point at which the steam is cut off from the boiler by the valve and the point at which it begins to use its expansive force, while the work imposed on the boiler is correspondingly less as the volume of steam necessary to do this work diminishes, which, of course, shows a saving in fuel and water consumption.

By this comparison I do not mean to be understood to say that such ideal results are possible with the use of any fuel, but I merely point out how this fuel will show a great saving by allowing the back-pressure as now found in our locomotives to be largely done away with.

I am indebted to my assistant, Mr. V. Z. Caracristi, late of the Chicago & Alton Railroad, for assistance in the mechanical experiments.

In one of my previous reviews I have pointed out the value of petroleum in the manufacture of illuminating gas and its value in metallurgy, in which field it is destined to revolutionize present methods. This latter proposition is all the more important when we consider the great possibilities of the silver, copper and mixed ores of Mexico, New Mexico and Arizona which are now practically without smelters to treat otherwise valuable outputs.

But I must not forget to deal with the value of petroleum in its relation to the sugar industry of Louisiana. Taking, as an average, cane giving 8 per cent. of centrifugals or 160 pounds per ton, the saving by the use of fuel petroleum over coal, in both cases using the bagasse from the cane, is one-eighth of a cent per pound of sugar produced, or a saving of $980,000 on the last Louisiana crop. In conclusion, I find—

1st. That experiments and practical tests have demonstrated that Texas petroleum from the Beaumont and similar geological fields will become a factor in the production of light petroleum distillates and products, and that as such it will control the Spanish-American markets of the Atlantic.

2d. That the use of Texas petroleum residuum in the production of commercially valuable asphaltum in paying quantities and quality is still in a state of experimentation, although I believe that some process will soon be evolved that will make the outlook for its possibilities more favorable.

3d. That the benefits to be derived by the use of Texas and all Southern fuel petroleums by the American merchant marine will largely aid in the restoration of American shipping, provided the supply shall equal the demand for the fuel.

4th. That the country of the Gulf and Atlantic seaboard, especially those sections removed from the Appalachian coal fields, will be greatly benefited by the discovery and use of cheap petroleum fuel to be used in the various manufacturing and metallurgical enterprises of which it is capable.

5th. That the railroads of the Southwest will partake largely of the benefits to be derived from the use of fuel petroleum, making it possible to reduce freight rates, and thereby fostering the development of dormant industries throughout the entire section.

6th. That by the use of fuel petroleum the cost of refining sugar is reduced one-eighth of a cent per pound.

C. F. Z. Caracristi

Some Industrial Needs of the South

By EDWARD H. SANBORN

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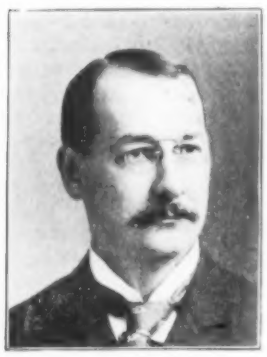
A comparison of Southern conditions as they appeared ten years ago and as they present themselves today is interesting as an illustration of progressive development and instructive in indicating a trend of further advancement that is both needful and desirable. Ten years ago the country heard the last echoes of the great Southern boom, an unfortunate attempt to hasten the development of the South by artificial stimulants, which brought profit to nobody, and for years caused suspicion to attach to every industrial undertaking based upon Southern resources.



EDWARD H. SANBORN.

There are still standing here and there monuments to the folly of those who tried to build cities with blast furnaces where neither ore nor coal was to be found, but these have come to be regarded more as curious landmarks than as ruins of unfulfilled hopes, and while they still serve as reminders of the futility of town-lot speculation, they no longer deter the investor who seeks opportunity in the South.

The beginning of another decade finds the South singularly free from speculative industry, save for the fever that has developed around the oil wells in Texas; but this craze is not in any way characteristic of the South, for oil is everywhere and always a great gamble. The extent of a coal field can be determined with accuracy, and the magnitude of an iron-ore deposit may be ascertained with exactness. You can calculate the timber on any given tract, and you can estimate with reasonable success how much cotton or sugar any certain acreage will yield; but when it comes to oil no man can prophesy whether the drill will develop a "gusher" or yield only a "duster." Therefore, if the millions of barrels of oil now flowing from Texas wells have caused sanguine souls to dream of colossal fortunes and to issue thereon untold millions of stock, the fault cannot be charged to the South.

Industrial operations in the South during the past ten years have been notably free from speculative tendencies, and have followed well-recognized business lines. The most striking expansion of manufacturing interests has been in the cotton industry, and here, while some conservative Northern manufacturers have looked askance at the rapid multiplication of mills in the South, they have merely questioned the wisdom and judgment of the builders, but have not condemned them on any speculative grounds.

It is well worthy of note that not a cotton mill has been established in the South in ten years past by the speculative methods which were applied so injudiciously to the iron industry a decade ago. There may be honest differences of opinion regarding the wisdom of such a rapid expansion of cotton manufacture as has taken place in recent years, but it cannot be said that there has been any attempt to apply town-lot boom methods to the development of this branch of industry.

It is rather significant that of all the millions that have been invested in Southern cotton mills, hardly a dollar has been attracted by advertising or obtained through the aid of speculative promoters. In nearly every instance where a cotton mill has been projected by men of experience and reputation the necessary capital has been secured without begging or bonus. The commission men of the North, who have marketed the product of most of the Southern mills, have shown their faith in the industry by making large investments on their own account and by influencing vast amounts of capital to seek the same channel of use and profit. Thus it has come about that the great distributing merchants, through whom nearly all of the cotton goods of the country are sold, have become the most important factors in the extension and management of this great industry in the South.

However much the Southern cotton manufacturers may have cherished a desire for entire independence in the conduct of their business, it must be conceded that the very large interests of the distributing merchants have been a powerful influence in strengthening the industry, in expanding its scope and in ensuring its stability. To this influence is due, no doubt, the lack of speculative elements either in the establishment of new mills or in the management of the old plants.

The conditions upon which the great industries of the South rest today promise permanence and prosperity. Their control by conservative business men, who are seeking to earn dividends rather than to sell certificates of stock or titles to town lots, ensures the stability of the cotton, coal, iron, lumber, sugar and numerous minor industries, and promises freedom from demoralizing speculation.

Probably it will surprise many to learn that the capital invested in the iron and steel industry in Alabama is less now by about $2,000,000 than it was ten years ago, in spite of the large sums expended during the past three years in the Birmingham district; but the greater significance lies in the fact that with this decrease in invested capital there was an increase of $5,000,000, or about 40 per cent., in the value of the product.

Only one entirely new plant of magnitude—the open-hearth steel works at Ensley, Ala.—has been established during the past ten years, but the whole iron industry of the South has been brought up to a business basis, and is now making money instead of promises.

It is equally true of the cotton, iron, coal-mining, lumber and sugar industries that the end chiefly sought during the past decade has been the improvement of equipment, the betterment of processes and an increased efficiency and economy in production. All of this tends in the direction of true progress, and enables the industries of the South to profit by the natural advantages they enjoy.

Several very apparent needs suggest themselves to one who looks carefully into Southern industrial conditions as they exist today. There is no novelty in

the declaration that the South needs a wider diversification of industries, for this has been preached for years, but nevertheless it was never a more urgent or more apparent need than today.

There has been an enormous expansion of the cotton-manufacturing industry, but the result is a vast increase in the output of staples, without any material diversification of the product. There has been a continuous improvement in the quality of the goods, some higher counts of yarn are being spun, and a few specialties have been added to the staple lines, but still the product is mainly raw material for Northern mills. Southern-spun yarns go North for knitting or weaving. Southern print cloths go North to be printed, and Southern sheetings and shirtings go North to be finished and distributed. One Southern plant has been successfully dyeing and bleaching certain lines of heavy goods for several years, and another plant has lately begun the finishing of finer goods, but these two works make hardly an impression upon the enormous output of the Southern mills.

It would seem that the greatest need of the cotton industry of the South is not a greater output, but a larger diversification of the present product and the addition of accessory industries to make use of the goods that are now produced, and to lessen the dependence of the industry upon the higher branches of manufacture in other sections of the country.

This need points to another necessity, and that is the training of help for better work. Thus far there has been an abundant supply of labor for the classes of goods that have been made in the South, but the scarcity of skilled labor for the making of finer grades of goods has been a deterrrent influence in all efforts to develop the industry in that direction. Never before has there been such a universal interest in industrial education as now manifests itself among business men and manufacturers. Thus far this country has relied upon its ingenuity and energy for the maintenance of its industrial supremacy rather than upon the careful training of labor.

The general recognition of the necessity for systematic and scientific education of the operatives themselves is now showing itself in the efforts to provide proper facilities for this kind of instruction. What the South is doing along this line promises large returns in the shape of more efficient help and higher grades of product, and it is probable that the developments of the next ten years in the Southern cotton industry will be in the direction of finer products rather than a greater output of staple goods which require further processes of manufacture before they go upon the market.

Conditions somewhat similar present themselves in the iron industry. The South has been a great producer of pig-iron for Northern foundries, rolling mills and steel works. With all the conditions requisite for the manufacture of open-hearth steel, it would seem practicable to send a larger portion of the product of the Southern iron industry to market in a more advanced stage of manufacture than pig-iron. The establishment of a large open-hearth steel plant at Ensley, Ala., two years ago, the building of adjacent wire-rod, wire and nail mills, and more recently the addition of other finishing mills, mark the largest and most significant steps that have been taken in this direction.

Lack of a local market, and the consequent necessity for shipping the output to a great distance, have largely hindered the diversification of the Southern iron industry, and this is a condition that is not likely to disappear for many years. In spite of these conditions, it seems probable that diversification of products will be the future development rather than an increase of production of crude material, upon which the margin of profit is smaller and the cost of reaching the consumer is proportionately higher.

The census figures thus far published show that while there has been an enormous expansion of the timber and lumber industries during the past ten years, there has been no proportionate increase in the industries which use the product of the saw-mills. In Mississippi the value of lumber and timber products has increased in ten years from $5,770,000 to $15,656,000, but in the same time the products of the planing mills and woodworking establishments has grown only from $136,450 to $1,315,775. In Georgia the lumber products increased from $6,545,195 to $13,704,923, but the growth of the dependent woodworking industries was only from $3,548,972 to $4,302,976. In West Virginia, with an increase in lumber products from $5,515,065 to $10,612,837, the growth of the output of manufactures of lumber was only from $910,640 to $1,820,463.

These are but statistical figures, to be sure, but they indicate conditions which present abundant room for a wider diversification of products.

Another urgent need of the South is the development of its possibilities in export trade. For many years the South has contributed to the export trade of the nation one of its largest single items—cotton—and it is possible to add to this several other items whose aggregate should run well up towards the value of the exports of cotton. Under normal business conditions the South should find a foreign market for as much pig-iron as all the Southern furnaces can produce. This is equally true of all the other forms of iron and steel that are now or can be made.

There are foreign markets for Southern lumber and timber far greater than those which have thus far been developed, and this branch of industry possesses possibilities of enormous development.

Southern coal is hardly known abroad as yet, but every ton that is now mined could find ready sale in foreign markets.

Southern cotton goods have become a very large factor in the foreign trade, as has been painfully evident from the unhappy results of the closing of the markets of China during the past two years. Large as are the exports of Southern piece goods, this trade is insignificant in comparison with the vast export trade of Great Britain in similar goods, with which it has been found that the Southern mills can compete successfully. Manchester merchants buy Southern cottons and ship them all over the world, but the Southern manufacturers have not as yet found their own way into foreign markets in more than an experimental manner.

In such prosperous times as the present, when there is a ready home market for everything that can be produced, it is difficult to arouse much enthusiasm about the possibilities of foreign trade; but when there should be less demand at home, and when accumulating stocks of goods shall compel either curtailment of production or the opening of new markets, then it will become evident that a study of foreign trade during these good times would have provided outlets of inestimable value.

Edward W. Saulsbury.

Best Things of the Old South Unchanged

By DAVID R. FRANCIS

President of the Louisiana Purchase Exposition

Your invitation to contribute an article for the Anniversary Issue of the Manufacturers' Record on the subject of the commercial and industrial development and progress of the South within the last tweaty years finds me so greatly burdened with duties pertaining to the projected Louisiana Purchase Exposition that I have not the time to do so fruitful a topic the justice it merits, and must content myself with a word of congratulation upon the splendid prosperity of the Southern States and the substantial contribution thereto of your paper.

DAVID R. FRANCIS.

Antecedent to the war between the States practically only one industry claimed the attention and inspired the industrial energies of the people of the States south of Mason and Dixon's line—cotton-growing. They were content to enjoy conceded pre-eminence in this, and made little effort to develop other fields of industrial activity or discover the enormous prodigality of nature in its inexhaustible deposits of coal and iron.

The war left the South prostrate in defeat and financial impoverishment, and the succeeding period, the dismal record of which should mercifully be expunged from the pages of our national history, accentuated her woes and degradation. This, happily, did not long endure the protests of the national sentiment of charity, generosity and fair play, and soon the "King was come to his own again."

Thenceforward the South advanced with giant strides. The deadened energies of her people were vitalized. Again there was "life in the old land." The heroism of the battlefield, attested on a thousand ensanguined plains, was illustrated in the more peaceful paths of human enterprise, in husbandry and the marts of trade. Fields of sugar-cane sprung again from the fruitful soil, and cotton wielded once more its ancient scepter. The smoke of a thousand forges clouded the Southern skies, and legions of delvers brought to light the black diamonds of the mountains, and the buzz of whirring saws sang the requiem of disappearing forests of pine and oak.

It is the marvel of the age, this resuscitation and rejuvenation of the Southland. Nothing like it has happened during the century just ended. This wonderful accomplishment is compassed within the little space of two decades.

Statistics tell the marvelous story of progress, but they are unsatisfactory and reach the eyes of few. The opportunity will present itself at the Louisiana Purchase Exposition at St. Louis in 1903 for the South to bring to the visible knowledge of the world the evidences of her boundless natural resources and the opulence of her productions, and to open the illustrated history of her commercial development, and in its pages, I imagine, may be read the auguries of a rivalry that will disturb the self-confidence and complacence of the North.

In this era of commercialism and materialism it is gratifying that the best things of the Old South are unchanged. The old-time hospitality, with its ineffable charm, its chivalry, its deference to high social ideals, its sturdy adherence to honorable business methods—all these are happily left, and the whole country is the better for it. The South is to be congratulated because in her great commercial and industrial prosperity she has lost nothing of her shining distinctive characteristics.

David R. Francis

THE SOUTH'S ADVANTAGES APPRECIATED

United States Senator Redfield Proctor of Vermont is hopeful of the South's future. He writes to the Manufacturers' Record as follows:

"The development of the resources of the South during the last decade and more is one of the great industrial features of the time. Her coal, iron, cotton, lumber, climate, etc., form a wonderful combination of advantages which is now being appreciated by the business interests of the country. It is safe to predict that this development is still in its infancy, and that there is a great industrial and commercial future in store for our Southern States."

The Average Worker for Southern Development

A COMPOSITE PORTRAIT WITH COMPOSITE FIGURES

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The record of the South's material progress during the past twenty years has been written in letters so large and so distinct that even the wayfarer, though a fool, may read as he runs, and may also understand. Accomplished facts are known, and their significance is fully comprehended. They are part of this country's history of great achievements. They speak for themselves.

They are not the result of haphazard fate. They mark attainment almost in the face of fate. They tell what the South as a whole has accomplished. They reveal the forces which have made them possible—the men of the South. There have been leaders among these men, often unheralded, and, indeed, in some cases, hardly recognized by the masses. To print even the merest outline sketch of the lives of hundreds of these individuals who have been foremost in the movement for Southern development and prosperity would require space beyond the compass of this anniversary publication. To describe each of them in turn would be but to repeat a description of the typical American, sanely ambitious, broadminded, courageous, alert, enterprising and full of the spirit of initiative.

But a way has been found, it is believed, to give in a few words a number of facts thoroughly indicative of the character of these leaders in work for the upbuilding of the South, and, consequently, for the expansion of American interests. The Manufacturers' Record has obtained photographs of twenty Southern men, all of them born, living and laboring in the South since boyhood, and twelve of them still in the State of their nativity, whose manhood has been occupied in building and extending railroad systems, in cotton-manufacturing, in conducting the iron and steel industries, in furthering commerce, in mining and in financing great developmental undertakings—in fact, in exerting intelligently and persistently all the energies which have brought the South to its present gratifying status. These photographs were entrusted to an artist, who arranged them in three groups as the bases for three composite pictures, which were subsequently combined in one portrait, herewith presented. This may be taken as fairly picturing the average Southern leader in real things for the welfare of his people and his section.

The ages of these twenty gentlemen range from thirty-six to seventy years. Six of them have not reached the age of forty-five, and four of them are more than sixty years old, which shows that men who were in the flush of manhood when the South was wrecked, and who reasonably might have been expected to succumb to untoward circumstances, have been shoulder to shoulder in bringing order out of chaos and in setting the South upon the pathway of progress with men who know nothing of the war, except by hearsay, and that neither youth nor age exempts Southern men from what they know to be their duty.

The average age of the twenty is fifty-one years and nine months—the prime of life. Here is the strong promise of greater successes. Their weights range from 138 to 216 pounds, the average being 175 pounds, and their heights range from five feet four and three-quarters inches to six feet one inch, the average being five feet ten inches. Weight and height guarantee longevity and physical endurance.

These men, in a majority of cases, have won their goal against tremendous odds. Some of them entered upon new careers with absolutely no equipment save brain power, good constitution and grit. Others, coming later upon the scene, have enjoyed the advantage of pioneer work done by their elders. Others, again, have cut out original courses for themselves. All have been inspired with sublime courage, stout hearts and steadfastness.

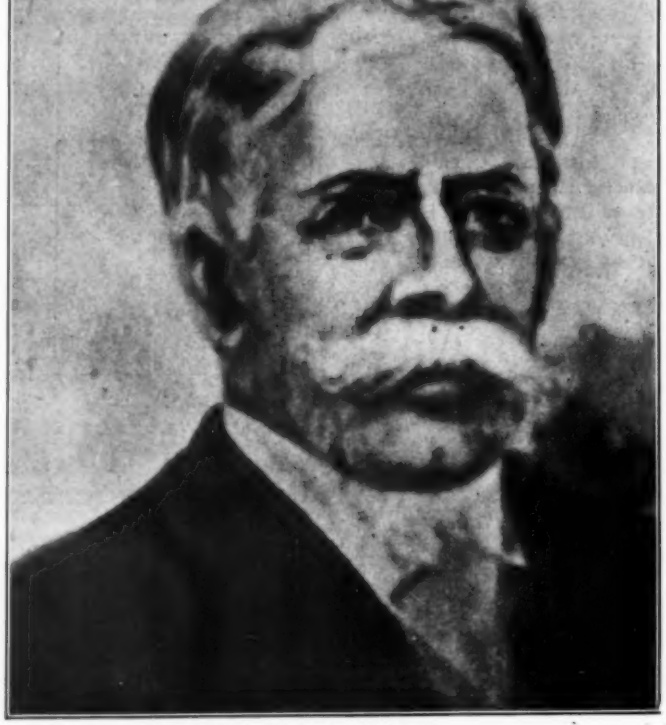
Their victories, though, have been made possible only through the direct and indirect seconding of their efforts on the part of the vast body of the population of the South. While individuals have gained the fame and the fortune which they well deserve, the whole body of the Southern people has shared in the material advance. Dealing in round numbers, and disregarding, as mutually corrective, the changes in schedules of the census dealing with average number of wage-earners and the value of products, it appears that the population has increased in twenty years from 16,300,000 to 23,500,000, or 44 per cent., while its productive capacity per capita, based upon the aggregate value of its agricultural, manufactured and mineral products, which increased from $1,045,000,000 in 1880 to $2,780,000,000 in 1900, or 166 per cent., has advanced from $64 to $116, or 84 per cent.

The increases in the value of products by classes have been: Mineral, from about $17,000,000 to $115,000,000, or 576 per cent.; agricultural, from $571,000,000 to $1,200,000,000, or 110 per cent., and manufactured, from $457,000,000 to $1,466,000,000, or 220 per cent. In the same time the number of wage-earners has increased from 305,000 to 793,000, or 160 per cent., and their productive capacity per capita from $1498 to $1848, or 23 per cent.

Marked advance in agricultural products has been made, notably in cotton, the crop increasing from 5,761,000 bales in the season of 1879-80 to 9,422,000 bales in the crop of 1899-1900, and in grain, the crop increasing from 431,000,000 bushels to 660,000,000, though the diversification in the direction of fruit-raising and trucking has made, perhaps, the greatest percentage of gain in this field. Yet the farming potentialities of the South have hardly begun to be realized.

The production of minerals shows in value the greatest percentage of advance of the three classes, though the quantity produced has increased much more than the value. The great gains have been in petroleum, which now has a production a hundred times that of twenty years ago, and the value of which is something less than half the value of coal produced, which increased nearly eight times; in iron ore, which has about doubled; in building stone, which has more than quadrupled; in phosphate rock, which has nearly trebled, and in lead, which has nearly doubled.

Cotton mills and industries dependent upon lumbering have, perhaps, led in the progress shown by the increases in the value of manufactured products, and it is noteworthy that while iron and steel production has advanced in value from $22,000,000 to $63,000,000, accompanied by an increase of about 2000 in the number of wage-earners, the workers in foundries and machine shops have increased in number by nearly 14,000, and the value of the products of such establishments from $15,000,000 to $40,000,000. Expanding figures of production in agriculture and mining, together with the increase in the number of farm holdings, the increase in the mileage of railroads from 20,000 to 53,000, and the development of various lines of trade, indicate a large accession to the number of workers for the South with hand and brain. Perhaps, though, it is enough for the present to know that with the population increasing 44 per cent., the number of wage-earners in manufacturing has increased 160 per cent., and their productive capacity per capita has increased 23 per cent.



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This is a composite portrait of twenty Southern men representing marked successes in the various lines of endeavor which have given the South material advancement.

It shows the average Southern man of affairs with the following physical qualities:

Age	**51 years 9 months.**
Height	**5 feet 10 inches.**
Weight	**175 pounds.**

This man typifies twenty years' increase in Southern productivity shown in the following figures:

	1880.	1900.	Increase per cent.
Population	16,300,000	23,500,000	44
Value of manufactured products	$457,000,000	$1,466,000,000	220
Value of mineral products	$17,000,000	$115,000,000	576
Value of agricultural products	$571,000,000	$1,200,000,000	110
Total value of all products	$1,045,000,000	$2,781,000,000	166
Wage-earners in manufactures	305,000	793,000	160
Total productivity per capita of population	$64	$118	84
Productivity in manufactures per capita of wage-earners	$1,498	$1,848	23

Cottonseed: From Waste to Millions of Wealth

By EDWARD FLASH, Jr.

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A retrospect of the cotton-oil industry for the past twenty-five years would be wonderful and amazing—indeed, phenomenal—were it not that it has only kept pace with the marvelous industrial development of the entire South. This period really embraces the history of the industry, and begins almost with its birth. A few small mills were in existence before the war, but naturally lay dormant during that time of stress and struggle, and during the period of industrial coma immediately following, when the whole South lay prostrate and paralyzed from the fierce struggle that had devastated its fair domain, and left behind as monuments so many charred and blackened ruins of mill and workshop.

EDWARD FLASH, JR.

All credit to the brave hearts and indomitable spirit of a people who have risen, Phoenix-like, from the ashes of such a cruel war within a single generation, put off the old order and taken on the new, and in such an incredibly short time in the life of a people covered its wasted fields with bounteous crops and its wide territory with a network of railroads, its many favorable sites with mill and factory, called in the surplus capital of the more fortunate North and West, irresistibly attracted by the promising opportunities for profitable investment, making what had been almost a desert "to blossom as the rose." The history of the rise and growth of the cotton-oil industry, therefore, is but the history of one of the many kindred developments that in the last quarter of a century have brought wealth and prosperity to the New South and challenged the admiration of the world.

In the old days "befo' de wa'" the insignificant cottonseed was a negligible quantity, or so considered, and the problem was how to get rid of it at least expense. No thought seems to have entered the mind of the rather easy-going and wasteful planter of that day of its vast potentialities for wealth. It found its way to the river or refuse heap, or was otherwise scattered and wasted—anyhow, to get it out of the way. It would doubtless have driven the energetic and thrifty millman of the present into the lunatic asylum to have seen great heaps of cottonseed actually rotting and wasting along river and railroad in those far-off days.

Practically, then, the crushing of cottonseed began in the early "seventies," the few mills then operating being principally at New Orleans and Memphis or in the Mississippi valley. The Bienville Oil Works at New Orleans appears to have been the very first cotton-oil mill established in the United States. Probably the whole number of mills in those days did not exceed a baker's dozen, with an annual crush of about 50,000 tons. Today there are upwards of 450 in the great cotton belt, extending in an unbroken chain from Virginia to Texas—yes, even lapping over the Rio Grande into Mexico—with an annual crush in the United States of 2,500,000 tons, employing a capital of about $100,000,000 and giving employment to 50,000 men. The figures are enough; they need no comment or explanation!

What this means in actual wealth to the South can be seen at a glance from the following figures:

Two and one-half million tons of cottonseed at this year's ruling prices means about $40,000,000, a pretty respectable total, and it must be remembered that every penny of this is "home wealth," so to speak—goes to the first producer, the cotton-planter, to be by him distributed in wages, food, plantation supplies and fertilizers.

Out of this colossal bulk of raw material, by the mysterious alchemy of the ubiquitous oil mill, comes a vast sum of manufactured product that finds its way to the far corners of the globe. Not a country of the civilized world but pays its tribute to the formerly despised cottonseed. The aggregate value of the product of this 2,500,000 tons will probably reach this year the record figures of $58,000,000.

To the lay reader the mere statement of the total is enough, but to those having a more direct or personal interest in the trade an analysis of the aggregate figures might prove interesting. The analysis must naturally be partly estimated or approximated, as we are now only in midseason, and in the face of the present uncertainty as to the size of the cotton crop and as to the prices that will rule for cottonseed product during the balance of the season up to September 1 next, it is apparent that reckoning output and value is somewhat uncertain.

We may divide the crush by States as follows:

	Tons.
Alabama	172,093
Arkansas	190,015
Georgia	271,833
Indian Territory	26,415
Louisiana	250,983
Mississippi	394,678
North Carolina	107,660
Oklahoma	26,425
South Carolina	156,642
Tennessee	168,307
Texas	692,604
Various	21,731
Total	2,479,386

These are the figures of the government census report just published for 1900. The present year's total crush will not vary much from this, although its division by States will not be quite the same, owing to difference in this year's cotton crop in the various States.

The composition of the aggregate product of $58,000,000 may be stated about as follows:

Crude oil	$32,000,000
Cake or meal	20,000,000
Linters	2,500,000
Hulls	3,500,000
Total	$58,000,000

The detailed yield in product of a ton of seed is about as follows:

	Pounds.
Crude oil	300
Cake or meal	750
Lint	30
Hulls	800
Wastage, sand, etc.	120
Total	2,000

The modern cotton-oil mill in full blast is an extremely interesting sight, even to those having no technical knowledge of the process of manufacture, and one of the striking features is its automatic nature. One might almost fancy that human hands were entirely superfluous—the seed going in one side of the mill as raw material and coming out the other as manufactured product. The process, briefly described and as free from technical terms as possible, is substantially as follows:

The seed is taken from car or boat by a long screw conveyor, reaching to track or dock, by which it is conveyed into the seedhouse and distributed to different parts of the building by an auxiliary system of conveyors. From the seedhouse it is again conveyed by the same means to the sand screens, where the dirt and trash are screened out; thence to a kind of gin called a "linter," where a portion of the short lint or fiber adhering to the seed is removed; then to the "huller," which is simply a cylinder fitted with a system of rapidly revolving knives, which cut the seed and hulls all to pieces; then over a series of shaking screens, or sieves, that separate the hulls from the kernels, or "meats," as they are technically called. This is a very important part of the work, as it is necessary to thoroughly separate the hulls from the meats in order to produce good oil and cake, and also to prevent loss of meats, which would go off with the hulls and be wasted if the separation were imperfect.

Here we part with the hulls, which are removed by the ever-useful conveyor, or endless belt, to the hull shed in some outlying portion of the plant. Now the "meats" are ready for business. From the separator they pass to the "rolls," a series of steel rollers, set one above the other, which partially crush the meats, so that the oil contained in the cells may be more easily liberated when the pressure is applied.

Then to the kettles, or "heaters," round, flat boxes, steam-jacketed, and provided with revolving arms inside, which slowly stir the mass as it is being heated or partly cooked by the heat from the steam jacket. After being sufficiently cooked, say, for about fifteen or twenty minutes, according to the condition and quality of the seed, the charge is drawn into a very ingenious machine called a "former," which just takes enough heated meats each time to make a single cake, each charge being formed by a slight pressure into the desired shape, so that these shapes, or loosely-formed cakes, may go to the hydraulic press, into which they are put, layer upon layer, until about a dozen or so fill the press. Then comes the pressure. Slowly the bottom of the press mounts and mounts; first slowly, and then in a stream comes the crude oil, flowing into a well or gutter at the bottom of the press, and thence being drawn off to the settling tank, the last stage of manufacture of the crude oil.

The press has now done its work. Down falls the bottom again, and out come a dozen or more bright, yellow cakes, which are quickly wheeled off to the drying-room to cool and to be packed into sacks as cake or ground into meal.

Now, as we have seen by following the process, we have four products—the oil, the cake, the short lint or fiber and the hulls. The oil being the most important product, let us follow it a little further on its journey from the field to the table, for the bulk of cotton oil produced in this country goes for human food, either here or in some other land less favored in edible fats.

The refining of the crude, then, is the first necessity, as little of the oil is consumed in its crude state. The refining process, while exceedingly important, is nevertheless very simple. The crude as it comes from the press is of a light-brown color and of an agreeable nutty taste and smell. From the settling tank, where we saw the crude deposited from the presses, it is pumped into a kettle provided with steam jacket and an interior steam coil and with a stirring arrangement for the purpose of agitating the oil. This refining kettle is nearly filled with crude oil, to which is added a certain percentage of caustic soda solution of varying strength, according to the nature of the oil to be refined. Heat is then applied in the jacket or coil, and the whole is agitated for a short time until a partial saponification takes place, which separates the coloring matter, as well as the albuminous and gummy matters and other impurities, and precipitates them to the bottom of the kettle, leaving pure yellow refined oil. This is drawn off from the precipitate to another tank, where it is submitted to a slow and moderate heat for the purpose of clarifying the oil and expelling all moisture, so that the refined oil may be clear and brilliant.

Then off it goes to the barrel or tank car, ready for its journey to the Western lard-compounder in tank cars, or over seas in barrels to its foreign friends.

Naturally, the past twenty-five years have done much to improve and perfect the machinery, but still neither machinery nor process is radically changed from what it was at the beginning. The same lines are followed, only with better machinery and more careful and scientific work, leading to better product and greater economy in manufacture. It must be confessed as remarkable that in all this period that has seen such wonderful changes and improvements in all manufacturing industries, no other successful and practical means have been found of extracting the oil from cottonseed or in refining it afterward.

The diffusion or solvent process, by means of naphtha or other similar solvent, has received considerable attention and many trials, and many predictions were made of a revolution in the cottonseed industry; but, submitted to the test of actual work in the mill, not in the laboratory, it was found unsuccessful and had to be abandoned, and the old method still reigns supreme.

The acid process, by which the lint was removed from the hulls by sulphuric acid, also had its trials, and again the threatened revolution was postponed.

In the refining, too, it is still the same old familiar caustic-soda solution that does the work, and nothing better has appeared, and although countless eminent chemists and savants all over the world have studied and experimented and cried "Eureka!" no better practical method has come to us, and so the trade still awaits its Moses to lead it into the Promised Land of a new crushing method and a new process of refining. Perhaps the next decade will bring the long-looked-for "revolution."

Now, given such an enormous increase in production, it follows as a natural sequence there must be an equally vast increase in consumption, and here again we find progress along the old lines—greater consumption in the old channels, but not much extension in the way of new uses. Perhaps the use of cotton oil in oleomargarine or butterine making and in various cooking compounds is the only new use that the past twenty years have brought. Cotton oil is used in "lard compound"—a mixture of refined and bleached cotton oil with beef stearine; and in oleomargarine, or butterine—a mixture of oleo oil and refined cotton oil and milk churned together, yielding a result so closely resembling butter that only an expert can tell the difference. It is used in its pure state as an edible or salad oil or for cooking purposes, for which use it treads hard on the heels of its great competitor, olive oil, not only here in this country, but even abroad in the home of the olive.

We may, perhaps, be pardoned a digression on this point to correct what we believe to be a general impression, namely, that the world's production of olive oil is much smaller than the world's production of cotton oil. This erroneous view may well be excused in view of the figures just given of the enormous production of cotton oil in this country. That this is a delusion, however, will be seen from the figures given below of the average annual production of olive oil in Southern Europe, in what might be called the basin of the Mediterranean:

	Barrels.
Italy	1,200,000
Algeria and Tunis	800,000
Ottoman Empire	700,000
Spain	500,000
France	200,000
Greece	100,000
Total	3,500,000

To most of us who are accustomed to seeing a bottle of olive oil and a tank car of cotton oil the above figures are a bit surprising.

To return to our subject. In the list of uses of cotton oil we must note its employment as a burning oil, especially in miners' lamps; also for a purpose little thought of in these prosaic and commercial days—as fuel to feed the flame of 10,000 altar lamps before the shrines of the Greek and Roman churches scattered far and wide over the old world and the new. Incredible as it may seem, the total figure for this consumption is quite appreciable, and runs into the thousands of barrels.

Last, but not least, we come down to the last resort of almost all greases, the soap kettle. It is here the surplus of cotton oil disappears, and it is the surplus that makes the price.

We have told of the production and uses of cotton oil, and in this connection it may be noted as a singular and curious fact that notwithstanding its general and widespread use, it is almost never sold to the final consumer as cotton oil, but always masquerades as "lard compound," as "margarine," as "olive oil," as "salad oil," or edible oil, as miners' oil, or heaven-knows-what oil, but never its own natural self, cotton oil! More's the pity that so pure and healthful a product should still need to borrow a cloak in which to make its bow to the final consumer.

To return to figures, the distribution of cotton oil over the world in a season of normal crop and normal prices is about as follows:

CONSUMPTION IN THE UNITED STATES.

	Barrels.
For lard compound	400,000
For soap kettle	200,000
For oleomargarine	50,000
For salad oil	50,000
For cooking oil	125,000
For burning oil	20,000
For sardine-packing	20,000
For miscellaneous	35,000
Total	900,000

EXPORTS.

	Barrels.
France	300,000
Netherlands	200,000
Austria	75,000
United Kingdom	65,000
Italy	60,000
Germany	55,000
Belgium	45,000
Africa	15,000
Scandinavia	20,000
Mexico	40,000
South America	30,000
West Indies	20,000
Various	40,000
Total	965,000

Apropos of the consumption of our American product by foreign countries, it must not be forgotten that England shares these markets with us, being our only large competitor producing cotton oil. The annual crush in England is about 400,000 tons of cottonseed, which comes principally from Egypt. The Egyptian seed is "bald"—that is, has no lint adhering to the hull like our American seed, and is crushed with the hull on, not separated as ours is, and in consequence the oil produced is inferior, and finds its use principally for soapmaking and other industrial purposes. The industry in England, after more than 100 years of what might be called independent existence, finally succumbed to the inevitable tendency of the times by consolidating, about two years ago, into one large company about 65 per cent. of the crushing capacity of the United Kingdom.

As to cake or meal, the distribution of the aggregate production of about 1,000,000 tons is rather difficult to give with even approximate correctness, as the government figures of export are so mixed with other kinds of oilcake that cotton-oil cake cannot be well separated. As near as can be estimated, about half is consumed in the United States and half exported, the principal importing countries being Germany, England, Belgium, Holland and Scandinavia. It is used here at home both as a cattle food and as a fertilizer, either in its pure state or as an ingredient in compound fertilizer. Abroad it is used as a cattle food only.

The short fiber, or "linters," reclaimed from the seed amount to about 150,000 bales, used principally as a filling for cheap cotton fabrics, for wadding or batting, for twines and for cheap mattress-making.

The hulls are used for cattle food, mixed with small proportions of the meal, or are burned as fuel in the oil mills. When burned, the ashes are carefully saved and sold for fertilizer purposes, as they are rich in potash and phosphoric acid.

So it will be seen that not a particle of our friend, the humble cottonseed, goes to waste.

On the financial side of the industry the period under review, which has seen such strides in the increase of mills, has also seen many vicissitudes in the "Profit and Loss" account. In the early days, when the production was small, the profits of the oil mill were tremendous. As the business increased the profits decreased, till in 1882 the fierce competition and dwindling profits led to the formation of a Trust, which, owing in part to speculation and in part to attacks upon the legality of the trust form of combination, narrowly escaped shipwreck. In 1889 the Trust sold its properties to a corporation now known as the American Cotton Oil Co., the leading organization in the business. Whatever may have been the speculative tendencies of this period, these unsettling influences have certainly passed away now, and today the organization named enjoys a deservedly high reputation for wise and conservative management and financial stability. To the influence of this company, both as a competitor and as an exemplar in improved methods of production and widening channels of consumption, the industry owes much of its growth; and while it has at times aroused fierce antagonisms in the trade, it has undoubtedly, on the whole, been an influence for good, acting always as a spur or goad to its smaller competitors. Undoubtedly, it has been an example of the old adage that "competition is the life of trade."

Next in order of size comes the Southern Cotton Oil Co., which was organized in 1887. This company, after maintaining a leading position in the trade since its incorporation, took a sudden leap into greater prominence and activity during the past summer, increasing its capital stock from $2,000,000 to $10,000,000, this increase being utilized for the purchase of a large number of formerly independent mills, so that at present it stands about on a level in crushing capacity with its great rival, the two companies making about one-half the total crush of the country. As this company is under the management of experienced millmen and has strong financial backing, it has a bright prospect of still larger growth and great success.

Following these two luminaries of the business comes a host of lesser lights too numerous to admit of naming, following each other in gradually lessening size and importance down to the humble little one-press mill, which, small though it be, still contributes its mite to swell the grand total, and is in no sense to be overlooked even by the giants of the business, as they have found to their cost in many a fiercely-waged seed fight in the past. Nor have the large companies any monopoly of good management or enterprise, as the history of many of the independent mills would show if space allowed even a brief résumé of their birth and life.

Whether the immense agregation of capital and mills in the two great companies will lead to the building of new mills, and force, for self-protection, the consolidation or combination of those now existing independently, is one of the burning economic questions of the hour, which time alone can answer.

Review of the Agricultural Advancement of the South since 1880, and its Capabilities

By J. B. KILLEBREW

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The reorganization of the agricultural labor system of the South after emancipation was one of the proudest triumphs achieved by the Southern people. With the most vexatious annoyances from the pseudo-philanthropists of the North, and dealing with an ignorant race that had been suddenly elevated to a political condition superior to that of their former owners, and who had no more knowledge of civil government or the rights of property than the Fiji Islander, it required the soundest judgment to formulate plans for immediate action, the greatest forbearance to endure the insolence and pretensions of the newly-enfranchised race, and the wisest forethought to prepare for future emergencies. A practical knowledge of the weaknesses and strength of the labor element was necessary to work out a problem as complex and as delicate as any that ever confronted the American people. The former slaveholders were without experience in the management of free labor. They were without sympathy from the government; they had no financial backing; they had to deal with a new order of things and with prejudiced ignorance. Impediments were thrown in their way by freedmen's bureaus, by the soldiery and by carpet-baggers, and every avenue of progress was either closed or obstructed. Amateur cotton and tobacco growers came in swarms from the North immediately after the war, and employed negro laborers at nominal prices to work upon plantations that had been temporarily abandoned by their owners. They ignominiously failed to reap the fortunes that the high prices of cotton and tobacco held up in gorgeous colors before their distorted vision. Neither the climate nor the soil nor the conditions of labor nor the management of the crops were familiar to them. The negroes who had depended upon their fair promises were left at the end of the year without homes and without the means necessary to sustain life. The result was they were deceived, disappointed, outraged and destitute, and in this condition drifted back, most of them, to their old homes and their old masters. They entered into contracts binding on the masters, but not enforcible against themselves, and thus began the first feeble upbuilding of a restored agriculture of the South.

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But there was of necessity much friction between the two races at first. The negroes were suspicious; their old masters were exacting, and gave a tardy assent to the just demands of the freedmen. Labor conditions as a result were very unstable. Farming operations were very precarious and uncertain. It was not until about the middle of the seventies that practices and policies, wages and partnership contracts settled down into a state somewhat permanent. This transition state of Southern agriculture was a trying period, and but for the knowledge which Southern masters had of the character and temperament of the negro race, added to the high prices of Southern staples, the condition of things would have been intolerable.

In this paper I purpose to show the growth of agriculture in the Southern States since 1880; how it has rapidly adjusted itself to ignorant labor; how it has gradually advanced from a low condition into one that is meeting the demands of the world for one of the most important staple crops, and how it has been lifted up, until it will now rank in many important particulars with the highest agricultural methods of any country. This growth under the intelligent direction of the Southern white man has in many respects been phenomenal, displaying thought, energy and an executive ability of no common order. It shows the masterfulness of manhood and the virile strength of a valiant people always accustomed to rule and to think for themselves.

The foundation of the rich agricultural resources of the South is its great variety of soils. These may be divided into two great classes:

1. The soils of the wide coastal plain which extends from the Eastern Shore of Maryland in an irregular semicircle to the western coast of Texas, embracing also the long peninsula of Florida. These are what are known as transported soils, and are made up of the detritus of rocks that have been carried by rivers or floods to a lower plain and deposited, making a surface comparatively level. These soils form the best cotton, sugar and rice growing lands of the South, and also produce many tropical fruits, early vegetables and fine tobacco. They vary from almost pure sand to an unctuous white or red clay, with every modification between them.

2. The soils derived immediately from the underlying hard rocks and left in place, or only carried and deposited in the river basins of the immediate vicinity, and called alluvial soils. The soils derived from the crystalline and unstratified rocks, such as quartz, hornblende, trap, micaceous schists, granite, etc., vary greatly in constitution and productive capacity, those derived from quartz only being pure sand and sterile, while those derived from granitic, trappian and hornblendic rocks are usually fertile. Coming to the stratified rocks, the soils derived from the limestones, dolomites, calcareous and aluminous shales, when intermingled in certain proportions with sand, are very fertile, and are so varied in their composition as to be adapted to the growth of almost every crop grown in America. The underclays have much to do with their adaptability for certain crops. It is this great diversity of the soils of the South, added to the diversity of climate and abundant rainfall, that assures such a versatility in vegetable life. The modifications of these varieties with different exposures make soils warm or cold, thirsty or wet, limy, sour, sweet, sandy, loamy, clayey, fine, coarse, gravelly, leachy, friable, fertile, sterile, etc.

The climate is a powerful factor also in the evolution of the wonderful agriculture of the South. Passing from the seashore of North Carolina westward or from the Mississippi river in Tennessee eastward, the traveler will, so far as the climatic conditions affecting vegetable life are concerned, traverse eighteen or twenty degrees of latitude. He will go from a subtropical to an Alpine region, as the flora will indicate. He will find plants and trees that have their habitat in the tropics, and others that we find only in the hyperborean regions of the North. The agricultural products of the South, whether taken discretely or concretely, are scarcely equalled in high qualities by those grown in any other country. The cotton fiber is the most useful grown; the tobacco has excellencies belonging to the tobacco grown in no other country; the oranges and the peaches are the sweetest and juiciest; the corn is the largest in ear and grain, and best suited for the making of bread; the rice is of the highest quality, and so it may be said of many other products. This perfection is due to the superb and diversified climate and to the varying capacity of the soils, derived from almost every formation known to geologists.

The soils of the South had been much injured by a pernicious system of cropping which was practiced immediately after the termination of the Civil War. Many fertile farms had been run down until the crops would scarcely pay the cost of cultivating them. Manurial applications began to be scantily used in the cotton and tobacco growing districts in the early seventies with satisfactory results. That the agriculture of the South at present is reaching a higher standard is manifested in the greater consumption of fertilizers, and the consequent enrichment of the soils; in the growing of many new field crops, and in the increased intelligence that is now brought to bear on the management of the farm. The liberal use of fertilizers is the surest index of an advanced agriculture. During the year 1896, the first year that a complete return of the consumption of fertilizers had been made from all the States, the South used 1,131,386 tons out of a total of 1,894,917 tons consumed in the United States. The succeeding year the South used 1,260,853 tons at a cost of $19,941,354. At present the South is using about 60 per cent. of all the fertilizers sold in the United States.

The benefits resulting from this liberal use of fertilizers are seen everywhere. Not only has the quantity of agricultural products been increasing at a rapid rate, but the yield and quality have been greatly enhanced and improved, and many old fields have been reclaimed from their sterile condition. Taking the wheat crop as an illustration, we shall find in a comparison of the crop of 1900 with that reported in the census of 1880 that the advance in the production and yield has been marked and gratifying. The total production of wheat as reported in the tenth census for the Southern States was 51,221,892 bushels, grown on 6,401,359 acres, showing a yield of only eight bushels per acre. For the year 1900 (United States Department of Agriculture) the total production was 93,358,836 bushels, grown on 7,211,570 acres, showing a yield of nearly thirteen bushels per acre. While the increase in the area sown in wheat between 1880 and 1900 was only 810,211 acres, or about 12 per cent., the increase in the quantity was 42,136,944 bushels, or 82 per cent. The increase in yield was brought up from eight bushels to thirteen bushels per acre. This shows more than the average yield for the whole country, which was 12.2 bushels per acre the same year.

Included in the estimate for the Southern States are those States that produce only a small amount of wheat, and that of a poor quality. If we take those States only in the South that produce a surplus, viz., Tennessee, Kentucky, Virginia, West Virginia, Maryland and Texas, we shall find the increase still more encouraging and gratifying. These States produced, according to the census of 1880, 41,087,952 bushels, which were grown on 4,593,782 acres, the yield per acre being 8.9 bushels. For the year 1900 the production of wheat for these six States was 76,597,222 bushels, grown on 5,435,102 acres, showing a yield of fourteen bushels per acre, which is nearly two bushels per acre greater than the average yield of the United States. The increase in acreage in these States in twenty years was 18 per cent., in quantity of wheat raised 86 per cent., and in yield per acre 57 per cent. In the production of wheat the great State of Texas went from 2,567,737 bushels in 1880 to 23,395,913 bushels in 1900, an increase of over 800 per cent. within this period. Tennessee increased its production within the same time from 7,331,353 to 11,696,088 bushels, the maximum having been nearly 14,000,000 bushels in 1898. Maryland increased in about a like ratio.

It is scarcely worth the time and space required to go into a more elaborate discussion of the increase in the production of wheat in the Southern States during the past two decades. Every phase of the question points directly to the conclusion that the Southern States, with the facilities for transatlantic exportation, will continue to increase their wheat production. Their resources in this particular have scarcely been touched. When the great Western prairies began to be settled, almost the only profitable crops that could be grown on them were corn and wheat. The Southern States found it far more profitable to grow cotton and tobacco than to produce grain. It thus came about that their capacity for growing grain was greatly underestimated.

Time will prove and statistics will show that Southern wheat will yet be reckoned a great agricultural resource, because it will make better flour than Northern-grown wheat, is suited for making macaroni, and can be raised at a profit as great as in the Western States when large areas are seeded, because of the cheapness of labor and the infrequency of failures from winter freezes or summer droughts. It brings a better price, one year with another, on the market, and the yield, by reason of the abundance and cheapness of commercial fertilizers, will be increased from year to year. The South will probably pass through the same experience that England did after the introduction of Peruvian guano, by the use of which the yield of wheat was raised from about an average of twelve bushels per acre to twenty-eight bushels.

The production of corn in the Southern States has kept pace with the increase in population. While the South-Central States of Kentucky and Tennessee have always been noted for their capacity to grow corn and swine, the cotton-planters in the Southern belt always, until recently, preferred to buy their supplies of corn and provisions from the Northwest. The quantity of corn grown in the Southern States in 1880 was 370,862,141 bushels, produced on 23,565,843 acres, giving a yield of fifteen bushels to the acre. In 1900 the production was 476,655,808 bushels, grown on 29,915,209 acres, showing a yield of sixteen bushels per acre. The increase for the period amounted to 26 per cent. But in making this comparison it should be borne in mind that the crop of 1900 was an inferior one in the South. In 1898 the corn crop for that region reached nearly 600,000,000 bushels, and the average yield was not far from sixteen bushels per acre. This, it must be confessed, is a low yield, but the more important crops of the South, especially cotton, wheat and tobacco, claim the best soils, leaving the poorer soils for the production of the corn crops. In the North and West the best soils are employed in the production of corn. The figures, therefore, showing the comparative yield of this cereal in the South and North are unfair and misleading.

Probably the most encouraging feature in Southern agriculture is in the rapid increase in the production of hay and forage crops. This is comparatively a new departure in the agriculture of that section. Up to 1860 nearly all the hay used in the South was shipped from the Northern States. The small amount produced led to the belief that Southern soils or the Southern climate, or both, were unfitted for the growing of the hay grasses. Even up to 1880 the tonnage of Southern-grown hay was exceedingly small. The census figures of that date show a production of only 1,412,964 tons, grown on 1,716,805 acres, which is only .82 of a ton to the acre. By 1890 this useful crop had increased threefold in the Southern States, and the yield had increased 35 per cent. The year 1900 showed a production of 3,730,053 tons, grown on 2,648,046 acres, showing a yield of 1.48 tons to the acre and an increase in yield of 80 per cent. It is worthy of note that the average yield for the whole United States during that year was only 1.28, showing that in yield the Southern States outstripped the Northern States. The amount of hay produced in the Southern States in 1898 was greater than for any preceding or succeeding year, being 4,386,669 tons, and the yield was 1.45 tons to the acre. A wonderful impulse has been given to the production of forage crops in the South by the introduction and cultivation of various plants, all of which belong to the leguminous or pulse family. Among those most frequently sown for making dry forage are red clover, alsike clover, crimson clover, Japan clover, bur clover, alfalfa, lupines, cowpeas, soja beans, the hairy vetch and many others. Two crops of all the leguminous plants may be grown on the same land in one year. This virtually doubles the capacity of the soils of the South for the growing of such crops.

The nutritive value of the hay made from these plants is very high, and the hay itself for domestic uses is superior to that made from timothy or red top.

The oat crop in the Southern States, notwithstanding the introduction of so many other forage crops, has been more than doubled in quantity since 1880. The census of that year gives 40,213,555 bushels, grown on 3,715,964 acres, showing an average yield of about eighteen bushels per acre. For the year 1900 the production was 83,998,246 bushels, grown on 4,006,037 acres, showing a yield of nearly twenty-one bushels per acre and an increase in production of 108 per cent.

The State of Texas has made the most rapid progress within the two decades, going from 4,893,359 bushels in 1880 to 28,278,232 bushels in 1900, showing an increase of nearly 500 per cent. The yield in 1880 was twenty bushels, and in 1900 thirty-eight bushels per acre.

Turning now our attention to cotton, the greatest staple grown in the South, and which furnishes one of the largest items in the foreign shipments of the United States, we find that by the census of 1880 the total production was 5,755,359 bales of 453 pounds each, amounting to 2,607,177,627 pounds, grown on 14,480,019 acres, an average of 180.5 lint per acre. This crop brought to the planters of the South approximately $255,503,597. The crop grown in 1900, and commercially spoken of as the crop of 1901, was 10,383,422 bales, which put into the farmers' pockets $494,567,549. This was an increase over the crop of 1880 of 4,628,063 bales, but considering the larger size of the bales of 1901 as compared with those of 1880, the increase in the number of pounds shows the percentage of increase in the crop of over 99. Add the value of the seed to the value of the crop of 1901, and it will easily swell the value to $550,000,000. The planters received more by $239,063,952 for the crop of 1901 than for the crop of 1880, though the price in 1880 was greater by at least one cent on the pound. The crop grown in 1898 and marketed in 1899 reached the highest point in production ever attained, being 11,235,383 bales, but it brought to the farmers only $321,877,296, which is less by $172,690,053 than they received for the commercial crop of 1901. The yield of the crop of 1880 was 215 lint pounds per acre, and of the crop of 1898, 225 pounds. Notwithstanding the poor methods used by many of the croppers in the South in the cultivation of this crop, the yield remains about the same, taking averages of five years.

No other crop grown in the South is so uniform in the quantity of production as that of tobacco. This quantity is subject to an increase or diminution almost solely by the character of the seasons and the ravages of insects. Unlike other crops, it cannot be increased at will, for a large outlay for curing-houses is necessary before any attempt can be made to enlarge the acreage. The crop reported in the census of 1880 for the South was 337,834,544 pounds out of a total for the United States of 472,661,158 pounds. This shows that the South grew 71 per cent. of all the tobacco grown in the United States in 1879. The production of this crop in the South in 1889 reported in the eleventh census was 360,464,445 out of a total of 488,256,646 pounds grown in the United States, which gives 73 per cent. of the whole. It is highly probable that this rate of increase will be more than maintained for the census of 1900. The increase of the crop in Kentucky, Tennessee and Florida will counterbalance any probable increase in the crop in New England and Wisconsin. The crop in Pennsylvania has, no doubt, been largely curtailed since 1880, at which time the dark wrapper leaf grown mostly in that State was in more active demand than it has been since. The extension of the yellow-tobacco area of North Carolina to the Champlain district of that State has increased the crop in that locality, but the planting in the Piedmont region and in the mountainous districts is not so large as it was in the eighties. The tobacco "trust," that has been organized to control the prices of such types of tobacco as are used for domestic consumption, has deterred planters, whether with or without just reason, from enlarging their crops.

The experiments in growing Sumatra and Havana tobacco in Florida are meeting with marked success. The quality of the Sumatra leaf when grown under canvas is as serviceable as that grown in the Dutch possessions of Sumatra. The flavor, aroma, fineness and attractive qualities of the best types of Cuban tobacco as grown in the Vuelta de Abajo district have been approximated, and it is not improbable that the "hammock lands" of Florida may yet rival the best tobacco-growing soils of Cuba. The high duty now existing on all importations of Sumatra wrappers and Cuban tobacco is doing much to stimulate extensive experiments not only in Florida, but in Connecticut.

The various types of tobacco grown successfully in the Southern States will always make the culture of this weed profitable. The white burley raised in parts of Kentucky, Tennessee and West Virginia; the yellow tobacco grown in Virginia, North Carolina, South Carolina, Tennessee and West Virginia; the heavy shipping leaf or export tobacco grown in Kentucky, Tennessee, and in parts of Virginia and Maryland; the sun-cured leaf of Spottsylvania county, Virginia; the "sweet chew" of Henry county, Virginia; the cigar tobacco of Florida—all these taken together show a greater variety of types grown in the South than can be grown in any other known quarter of the globe. Southern tobacco is used equally by the crowned heads of the Old World and the ichthyophagous savages that squat on the oozy banks of the Congo. It is in demand in every country that commerce reaches. It pays a large proportion of the internal revenue taxes of every government in Europe. It has become the staff of nations—the rich man's solace and the poor man's luxury. For nearly 400 years the South has supplied the largest proportion of the tobacco of commerce, and it is not improbable that in the thirtieth century it will be supplying this narcotic or stimulant, the least harmful of all those that pervert the human understanding or enfeeble the human frame. It is the one narcotic or stimulant that does not affect injuriously the moral character of the user, and in its influence in destroying the appetite for more deleterious drugs it may be regarded as a benefactor to mankind.

Another crop that is destined to swell the profits of Southern agriculture is rice. The census of 1880 reported 110,131,373 pounds of rice, grown on 174,173 acres, giving an average yield of only 632 pounds per acre. The next decennial census reported 128,590,934 pounds, grown on 161,312 acres, showing an average yield of 797 pounds per acre. The crop for 1900 was 219,278,200 pounds, and for 1901 285,750,000 pounds, an increase of 130 per cent. since 1880. Through the influence of the Agricultural Department at Washington Japanese seed-rice was imported and distributed to the rice-planters. Its substitution not only greatly improved the yield, but the quality is superior to that grown in any other country. So satisfactory has been this experiment with Japanese rice-seed that a large sum of money (estimated at $20,000,000) has been invested in the growing of this crop in the Gulf States, mainly in Texas and Southwest Louisiana. These lands have increased enormously in value during the past five years. The importations of foreign rice have been reduced from 154,000,000 to 73,000,000 pounds. The low-lying districts of Texas, Louisiana, and the seaboard of the other Southern Gulf and Atlantic States are far superior to any portions of India or Japan for the growing of this great food grain. The outlook for the Southern crop is indeed full of promise.

The experiments in the growing of tea made near Summerville, S. C., by Dr. Charles U. Shepard have demonstrated that excellent tea may be produced in favorable localities in the South at a cost of fifteen cents per pound. So encouraging have these experiments been that steps are being taken by capitalists to establish large tea plantations. Dr. Shepard sold all his product at remunerative prices. The yield was 400 pounds to the acre. Some choice lots brought $10 per pound. This is an industry that has boundless possibilities in the South, and serves to emphasize the fact that soils may be found in the South suited to the growth of nearly every vegetable product used by mankind.

The sugar industry of Louisiana has made fair progress since 1880. The census report of that year gives the total production of cane sugar grown in the Southern States at 301,284,395 pounds. For the year 1900-1901 the production in Louisiana was 504,800,000 pounds. The crop of 1897-1898 was 695,401,280 pounds. The increase from 1880 to 1900 was 67 per cent. The increase from 1880 as compared with the year of highest production was 130 per cent. The average annual importation of sugar into the United States for the years 1896-1900 was 3,900,700,448 pounds. Taking the year of greatest production, and it will be seen that the cane sugar made in the South is more than 17 per cent. of our total sugar importation, including that imported from our island possessions. There is no doubt that with proper encouragement Louisiana, Texas and other Gulf States would be able to meet a demand equal to the present requirements of the people of the United States. It is probable, however, that our tropical possessions will be able to produce it more cheaply than the Gulf States. The fact remains, nevertheless, that the sugar-growing South-

ern States, should it become necessary, have the soils and climate to meet all the demands of our people for this now necessary product.

Truck-farming and fruit-farming in the South have advanced more rapidly since 1880 than any other branch pertaining to Southern agriculture. This is due to three causes:

1. To the adaptability of the soils and climate of the South to the growth of fruits and vegetables.

2. To the employment of refrigerator cars and the establishment of special fast-running trains for the transportation of fruits and vegetables to distant markets.

3. To the active and increasing demand all over the country for such products.

There is no doubt of the fact that the soils and climate of the South are suited to the production of all kinds of fruits and vegetables grown in the United States. Ever since the first settlement of the South by the white man apples, peaches, pears, plums and other fruits have been grown for domestic use. The sparseness of the population did not for many generations justify any experiments in the way of shipping to distant markets, nor was it thought to be practicable until about 1854, when the truck-farmers around Norfolk, Va., began to ship their fruits and vegetables to the Northern markets. For some years before that time they frequently shipped their surplus in coastwise vessels to the nearest seaboard cities, but the first shipment to New York of 200 packages was carried by the steamer Roanoke in 1854. The success of this venture stimulated the shipments somewhat, but the want of ventilation during the long voyage restricted the size of the cargoes, as they were limited solely to the upper deck of the vessels. However, a desire was created among the New York consumers for early vegetables and fruits, and the demand continued to grow. But it was not until the ingenuity of the shippers wrought out the problem of long transportation by the use of refrigerator cars that truck-farming assumed continental proportions. Mr. Park Earle of Cobden, Ill., and Mr. F. A. Thomas of Chicago are entitled to this honor, the former first shipping in 1866 strawberries by express in refrigerator chests to Chicago, Pittsburg, New York and other places, and afterwards building refrigerator cars. Mr. Thomas established a through service of refrigerator cars from the truck farms to the places of destination to be operated like sleeping cars in the passenger service. Operations were first begun in 1887 in shipping strawberries from West Virginia to the Chicago market. There are now probably fifty private refrigerator-car lines, besides the many cars operated by the railroads themselves.

The growth of the truck industry has increased so rapidly since that time it is hard to keep pace with it. The steamships have been so arranged that 25,000 packages of vegetables are not an uncommon cargo for a vessel plying between Norfolk and New York. I quote from Bulletin No. 21 issued by the United States Department of Agriculture on this subject:

"In 1899 Norfolk shipped to Northern markets over 2,200,000 packages of fruits and vegetables. The shipments of spinach and kale in that year amounted to nearly 250,000 barrels, while over 130,000 crates of berries were distributed. Watermelons to the number of 658,188 were also shipped."

In the Wilmington (N. C.) fruit and vegetable district we learn from the same source that "an average of 25,000 acres of vegetables and fruits is planted each year in Southeast North Carolina. The varieties grown include cabbage, potatoes, beans, peas, asparagus, cucumbers, spinach, tomatoes, melons and grapes, strawberries, pears, peaches and other fruits. This acreage is said to average 100 packages of vegetables per acre per annum, which would make 2,500,000 packages. Averaging the selling price of the package at $1.50 would make the trucking and berry-growing industries of this section worth, at close market value, $3,750,000 per annum. This would, of course, include the cost of production and transportation.

"Strawberry cultivation is carried on most extensively in this district—perhaps more so than in any other section along the Atlantic seaboard. It is estimated that between 11,000,000 and 12,000,000 quarts were sent to Northern markets in refrigerator cars during the spring and early summer of 1900. The berries begin to move about the middle of April, but the shipments up to the beginning of May are light, and are generally forwarded by express. As the shipments become heavier, refrigerator and ventilated cars are substituted. From Wilmington to Goldsboro, a distance of eighty-four miles, nearly every station along the railroad is a shipping point for strawberries and other garden truck.

"It has been estimated that the average net profits per acre on vegetables grown in this district are as follows: Asparagus, $93.63; beets, $95; snap beans, $42.96; cabbage, $113.61; cucumbers, $175; watermelons, $32.06; cantaloupes, $55; peas, $57.37; Irish potatoes, $101.60; sweet potatoes, $106.50; spinach, $70; tomatoes, $94.72."

The whole Atlantic coast from Baltimore, Md., to Savannah, Ga., and the whole State of Florida may be considered a fruit and vegetable district. Southern Georgia grows the largest quantity of watermelons. South Alabama and the delta region of Louisiana, the Texas coast, the region around Crystal Springs in Mississippi, nearly the whole of the meridianal center of West Tennessee, portions of North Alabama, North Georgia, East and Middle Tennessee have developed an immense trade in fruits and vegetables. The magnitude of this trade may be inferred from the fact that the Illinois Central Railroad shipped 251,722 tons, or about 17,000 cars, of fruits and vegetables over its line for the year 1901, 5000 cars of which probably originated in the South. The Southern Railroad hauled for the year ending June 30, 1901, 163,397 tons of fruits and vegetables that originated on the line. This is equivalent to about 10,893 cars. The Nashville, Chattanooga & St. Louis Railway hauled 4296 cars of the same character of freight during the same period, 676 cars of which originated on the line. The Central of Georgia Railway Co. shipped for the season 1901 1010 cars of peaches and plums and fifty-three cars of cantaloupes. In one single day as much as 153 carloads of strawberries were loaded in one district in West Tennessee, where but few were grown for market twenty years ago. More than $40,000 were paid out to the strawberry-growers, packers, cratemakers and wagoners for this shipment of one day. In the peach-growing district on the Western & Atlantic Railroad the number of peach trees that have been planted during the past five years is over 2,000,000. The territory on the highland rim west of Nashville, Tenn., is now assuming the appearance of a fruit-growing district.

The fruit and truck industry in the South is yet in its infancy. With the use of fast refrigerator steamships there is no reason why the early fruits and vegetables of the South may not be served at the tables of the rich and the poor in the capitals of London and Paris, Berlin and Vienna within ten days after they are gathered. The peaches and tomatoes of the South would be among the most highly appreciated luxuries ever introduced into these markets. The time is not distant when thousands of acres of land in the South now practically valueless will contribute to its wealth, add to its beauty and regale with its delicious fruits the appetites of our transatlantic friends.

There are many other field crops grown in the South, such as potatoes, peanuts, hemp, flax, broom-corn, beans, peas, popcorn, rye, barley, buckwheat, Kaffir corn, sorghum, hops, etc., that cannot be properly treated within the limits assigned to this paper. It is sufficient to say that with one or two exceptions they have increased in quantity, quality and yield during the past twenty years. Nor can I speak of the growth and development of the honey or poultry industry or of the products of the dairy, all of which are making gratifying progress.

Turning now to the live-stock industry, I compile the following comparative statistics for the fourteen Southern States, none being available for 1900:

	1880, Census.	1899, U. S. Dept. of Agriculture.
Horses	2,697,672	3,382,925
Mules	1,179,658	1,461,929
Cattle	12,165,026	10,945,743
Swine	16,581,223	(1898)—18,028,809
Sheep	7,610,350	5,437,283

These are the latest trustworthy statistics. They show an increase in the number of horses of 25 per cent., while the whole country during the same period showed an increase of 30 per cent. The increase in mules in the South during the nearly two decades under consideration was 24 per cent.; for the whole country 15 per cent. There was a decrease in the number of cattle in the South of 10 per cent., and a decrease in the whole country of 23 per cent. On the other hand, there was an increase in the number of swine in the Southern States of 8.7 per cent., and a decrease in the whole country of 19 per cent. The percentage of swine reported for the South in 1880 as compared with the whole country was 34 per cent.; in 1890, 28 per cent.; in 1897, 48 per cent., and in 1898, 43 per cent.

The large falling off in the number of sheep is not due to the want of adaptation of the climate of the South to sheep husbandry or to the lack of suitable pasturage, but entirely to the presence of the "yellow dog" that is seen in every farmhouse and cabin, even though the occupant is possessed of no other property whatever, and also to the indisposition of the average legislator to endanger his popularity by voting for a law that will repress the dog and protect the sheep. Wool and mutton, if the flocks were properly protected against canine depredations, could be grown as cheaply in the South as cotton and pork. The perennial pastures of Bermuda grass in the extreme Southern States and the expansive highland pastures covered with numerous species of the grass family that stretch for leagues and leagues through the open park-like woods of the border States; the presence of the Japanese clover, that grows with a prodigal luxuriance on all soils—all these together are capable of carrying as many sheep as any of the prairie lands of the West, with the advantage of plenty of shade and water and nearness to market. There are known to be 295 species of the grass family in the South between the Mississippi river and the Atlantic ocean. Many other species occur on the plains of Texas. A large majority of these are relished by sheep. There are also hundreds of wild leguminous plants upon which sheep thrive and fatten during the greater portion of the year. The cowpea hay, that may be grown on the thinnest soils, and other forage crops that may be produced almost at a nominal cost will carry the flocks through an average winter of three months for less than twenty-five cents per head. Every acre of wheat sown in October will usually have the capacity to support by its grazing capacity a ewe and lamb until spring. The wheat is not injured by such grazing unless done in wet weather. In time the South will rival England in the excellence of its mutton, and Australia in the usefulness, quantity and fineness of its fleeces. The wool produced in Tennessee took the highest prize at the great London Exposition in 1851 when brought in competition with the fleeces from all nations.

Recapitulating these facts, we find the following percentages of increase since 1880:

CROPS.

Wheat	82%	Tobacco: Types grown largely increased and markets much improved.	
Corn	26% to 60%		
Hay	164% to 210%	Rice	130%
Oats	108%	Cane sugar	67% to 130%
Cotton	99% in production.	Truck and fruit farming	1000% or more.

LIVE-STOCK.

Horses....20%	Mules....24%	Swine....9%

If one will carefully study the foregoing figures he will see that the South is progressing in agricultural development more rapidly than the whole country. This is a matter of congratulation when we remember that ignorant labor only, for the most part, is employed in Southern agriculture, and when we further remember that nearly all the surplus earnings of the people have been put in manufactures or mining. It must be borne in mind also that the impediments to agriculture brought on by the results of the Civil War were not shaken off until towards the middle of the eighth decade.

In reference to the adjustment of labor to Southern conditions it may be said that the negro soon came to a realization that his old master was his best employer, and his master recognized the fact that the negro is superior to any other labor for the cultivation of cotton, rice, sugar and tobacco plantations. His capacity to endure heat, his practical experience in the working of Southern crops, his fidelity to his employer who knows how to treat him, his physical strength, his happy temperament and disposition, and his docility are all points in his favor so commanding that he can never be replaced by other labor unless bad influences alienate him from his white friends, destroy his

useful qualities and impair his efficiency as a laborer. He and the white man of the South have learned through long experience to understand one another, both in a business and social way. Whoever attempts to break the amicable relations that for the most part now exist between the two races in the South is an enemy to both.

It seems never to have occurred to persons discussing the conditions of Southern agriculture that the lands of the South after emancipation were greatly depleted; that under the system of slavery and the existence of large areas of wooded lands it was considered good husbandry to clear up the land, cultivate it until it ceased to be profitable, and then to turn it out into "old fields," in which condition it would lie fallow and supply a scanty pasturage for stock. Not until the South ceased to be a purely agricultural region did the agricultural classes recognize the value of these abandoned old fields. Manufacturing establishments that began in the eighties to spring up all over the South made it possible, with fertilization, to cultivate these fields with profit. The growth of yellow tobacco in Virginia and North Carolina and of peaches in Georgia made such lands of greater value than when they were first opened to cultivation.

What of the future of the South? It is yet a new country in everything except name and fame and the transcendent virtues of its best citizens. With an area of 831,201 square miles, only 20 per cent., or 166,610 square miles, have been brought into cultivation. What its agriculture will be in fifty years, with its almost infinite variety of soils and climate, with aptitudes to grow all the most valuable vegetable products of the earth, and with its great beds of phosphates to preserve their fertility, no one can predict. When more capital and more intensive agriculture and more intelligent labor are applied to its development it will literally become the garden spot of all the earth. It is blessed with every soil; it grows nearly every crop; it breeds every valuable domestic animal; it stands in the highway of the coming commerce of the world; it has an ocean frontage of more than 3000 miles; it is traversed by some of the grandest rivers on the earth; its healthfulness for the insistent and strenuous Anglo-Saxon is not surpassed by that of any other country; its climate is so beautiful and so generous, so free from the extremes of heat and cold, from excessive humidity and destructive aridity, so prolific of all the fruits of the earth, and with such plentitude in its amenities that the habitable globe can furnish no superior to it. No other place is more desirable for the permanent homes of a highly intelligent Christian people. It occupies the latitude and isotherms of the world's highest civilization and greatest achievements. The great minerals of a progressive and aggressive civilization, viz., coal, iron, copper, lead, phosphate, marble and many others, exist in abundance. These minerals, with the textile fibers, forests and tobacco, can furnish the raw materials to give employment to 50,000,000 people engaged in other pursuits than agriculture, and the soils of the South can feed and clothe them all. The South is the grandest heritage ever bequeathed to man. It is a region where intellectual endowments and high moral character and a vigorous individuality count for as much as material magnificence and financial strength. It is a part and parcel of the greatest, richest and most progressive nation that the sun ever shone upon, controlled by a government well-nigh perfect in all its agencies for the security of life and property and the administration of justice.

May our patriotism and virtues be equal to our heritage, and may we be able to transmit this heritage unimpaired to descendants more worthy than ourselves and more capable of carrying it onward from universal liberty to universal good.

Progress, Resources and Products of the South-1886-1902

AS OBSERVED BY A NEW ENGLANDER

By H. M. ATKINSON, OF ATLANTA

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Fifteen years is not a long period, but the last fifteen years has seen wonderful changes in the South. It means much more than such a short period would ordinarily mean in the progress of any large section of the country. During this past fifteen years the South has advanced, perhaps, more than during any other period of its history in laying the foundation for its future industral greatness. Consequently, a brief history of the last fifteen years tells a large part of the story concerning the prospects and future development of the South.

H. M. ATKINSON.

Perhaps the last fifteen years have been, in a sense, the most important period as affecting the South's future. It has been a formative preparatory period. Momentum has been created along lines which are today firmly established, and which from now on will probably be followed with a constantly accelerating pace.

To one who can look over the fifteen years from 1886 to 1902, the progress of the South has been remarkable, and great changes have taken place. The growth has been sure and permanent. There has been no halt, and the advance has been general and over a wide area. Booms have been infrequent, and have only affected scattered spots.

The basis of development has been broadened and strengthened gradually, so that the false steps have been comparatively few, and there has been small amount of waste effort. Growth, in the proper meaning of that word, has been sure and steady, and there have been few such artificial and unhealthy activities as have distinguished the development of the West.

Owing to past unfortunate conditions, the onward movement has met with difficulties, and the path has not been an easy one. This, in the long run, will prove a blessing.

The development accomplished has been mainly the work of Southern men, and herein lies the inherent strength of the South's position today. The advance has been natural—that is, has been built up from within, without undue artificial stimulus from without.

The Southern people had to begin anew after the war. They had to face adversity and the greatest hardships. The ground gained will, consequently, not be lost. There has been no overreaching; there are few steps to retrace.

This means, naturally, that the position of the South today is a safe one—safer, probably, than that of any other section of the country, owing to the natural character of the evolution that has gone on. There has been no overextension, because the means to create it has not existed. The South naturally had to live from hand to mouth for many years, and it is only within a comparatively recent date that any surplus of capital has been accumulated. Making the best of what it had, it has gone slowly ahead, and this stern necessity will in the end prove its strength.

Left almost destitute in '65, without capital and almost without friends, now look at the contrast in 1902, thirty-seven years later. What marvelous changes, even to one whose range of vision only covers the past fifteen years! Could any country, started anew from practically nothing, have accomplished more in so short a time—one generation—and in the face of such adverse and unusual conditions as the war left?

Let us glance hastily over a few instances as showing what has been accomplished.

Compare the railroads in the South today with those of fifteen years ago. Look over the magnificent system of the Southern Railway Co. as one of the best examples of development—a property the future possibilities of which can scarcely be estimated. Take the line of this road running from Washington to Atlanta. Look at it and its surroundings fifteen years ago, and see what it is today. Follow it, for instance, from Danville, Va., to Greenville, S. C. The country is generally improved in character, and we find one constant succession of cotton mills, usually running at night as well as day.

Go back fifteen years and compare the Atlanta of '86 with the city of today. Atlanta is, perhaps, the most remarkable city of its size on the American continent. The war left Atlanta in ashes, and it is, therefore, about thirty-five years old. Few cities in the world can boast of such a climate and such an energetic, loyal population. It is bristling today with life and activity, and presents the very best type of a modern American city. It is a metropolis, and has all the varied interests that go with that name. It is destined to become more and more the business center of the South. It will more and more become the type of the material, educational and social development of the South.

One hundred and seventy miles west of Atlanta we find Birmingham. The development here is a revelation. Perhaps the same natural advantages for the manufacture of iron and steel cannot be found in the world. The manufacture of steel and its products at Birmingham on an immense and commercially successful basis insures the future of the city. In the Birmingham district iron ore, coal and limestone are found practically side by side in inexhaustible quantities. The great development already accomplished in and around Birmingham, notably at Ensley, and the immense industries now projected there, in their effect on the future of that city can scarcely be calculated.

The above are only instances that show the general drift and current of events. They cannot escape the attention of any thinking man. They can but mean one thing as regards the future. In a short article like this it would be impossible to do more than hastily glance over the situation and call attention to a few prominent examples that but serve to show what is going on generally.

In natural resources the South is by far the richest section of the United States. All we can attempt is to run hurriedly over the list of some of the raw materials.

It is natural to mention the cotton crop first, and it is the most remarkable of all. Look back over a long period of years, and can anything approaching a failure of this crop be recalled? Take 10,000,000 bales as an average annual crop, and see what it means. At seven cents per pound this average crop, grown out of the ground each year, amounts to $350,000,000, to say nothing of the cottonseed and its products, worth, in addition, $60,000,000. A few years ago the cottonseed, beyond what was needed for planting, was thrown away. Today an immense business has grown up for the handling of the seed and

its manufacture into many articles of commerce. Great advance has been made in the handling and baling of cotton, so that an immense saving is being effected in every step connected with the handling of the crop, from the ginning until it reaches the mill. It is scarcely going too far to say that the South can grow rich from the savings that can yet be accomplished in the handling of the cotton crop and cottonseed alone.

Consider next the long and varied list of products of the soil that can be grown in the Southern States. Look over the ground from Virginia on the north down south to the Mississippi river and the Gulf of Mexico. It would be difficult to name a fruit or vegetable that cannot be successfully produced. The fruit industry in Georgia and Florida has grown to be of great importance, and is constantly increasing. The fact that fruit can be picked after it has ripened and shipped in the best condition to the Eastern markets gives the South a great advantage in this industry.

Consider the vast tracts of timber. Foremost among the timber interests is the yellow pine, with its many varied uses, safely one of the most useful kinds of wood that grows. The annual product of long-leaf yellow-pine lumber is of immense value. In addition, there are areas of hardwood forests that have barely been touched.

There is a long list of minerals and building stones. The marble quarries in North Georgia have just fairly started. Granite of the best quality is to be had, clay in the best quality for bricks, iron ore of many varieties. These are only a few.

Coal of the best steaming quality is to be found over a very wide area of the South. There seems to be no limit to the production of coal.

Discoveries of oil have added a new and important item recently to the long list of riches.

Last, but most important of all, consider the climatic conditions. A large section of the South has a climate that is unequalled—a climate requiring a minimum of food and clothing and affording a maximum of sunshine. A good climate has as much effect in producing happiness and comfort as most of the other influences combined.

It is, of course, impossible to go into lengthy or detailed statistics in so short an article. The following facts, however, bear strikingly on the foregoing remarks and illustrate the truth of what has been said.

The growth of the rural population of the Southern States during the decade ending in 1900 shows most strikingly the advantages of the climate and soil that this section possesses. The census of 1900 shows a total gain in the rural population of all the States and Territories of the Union from 1890 to 1900 of 4,449,600. Of this total gain, fourteen Southern States, excluding Missouri, furnished 2,640,720, or nearly 60 per cent. of the total increase of the whole country in rural population, while all the remainder of the Union, including the immense States and Territories of the West, furnished 1,808,880, or about 40 per cent. of the whole increase in rural population.

This is a most striking fact when it is borne in mind that great immigration bureaus have been in constant operation with a view to carrying foreign emigrants to the States and Territories of the great West, and that none of the increase of population by the South was brought about by an influx of people from foreign lands.

Furthermore, this fact becomes even more important when it is remembered that many of the States of the Union absolutely show, by the census of 1900, less rural population than they had by the census of 1890.

While the rural population of the Southern States increased 17.4 per cent., the rural population of all the balance of the country increased only 9.2 per cent.

Nor does this mean that the Southern population increased only in the rural districts, for the cities and towns of the South increased during the same decade 35 per cent. of the total increase of the South, while the increase of the country districts was 65 per cent. of the total gain.

The growth of the cities and towns and country in Georgia can be taken as an illustration of the equal and harmonious growth in rural and urban population. A careful estimate will show that in 1890 76.6 per cent. of the people of the State of Georgia lived outside of the cities and incorporated towns, whereas in 1900 75.7 per cent. lived outside of the cities and incorporated towns, which is to say that today about the same proportion of the population of Georgia lives in the country as in 1890. During the decade the rural population increased 267,105, and the cities and towns of the State increased 111,873.

The fact that the climate is delightful and that the crops in this section rarely, if ever, fail, and that every kind of crop can be grown to advantage, and that, hence, men find it profitable to live on farms in the South, accounts for the fact that the country is increasing in population in this section more than in the remainder of the United States, and also for the fact that the growth of the cities and of the country are keeping even pace with each other.

The great amount of manufacturing done in the Southern States and its increasing importance cannot be overlooked by any student of the progress of this section.

Since 1850 the output of the factories of the State of Georgia alone has increased over 900 per cent. By the census of 1900, the annual product of the factories in Georgia amounted to over $106,000,000, or nearly twice the proceeds of an average year's cotton crop of the State.

The sum of about $23,000,000, by the census of 1900, is paid annually as wages to laborers in the factories of the State, a sum more than equal to one-half the value of an average year's cotton crop. Cotton is still a monarch of high degree, and always will be, but other kings are rapidly coming to the front and rapidly claiming equal importance.

The brief sketch I have drawn above of what has been done in the South and what there is to work on indicates that the prospects of the South today are brighter than those of any other section of the country. The South has just fairly started on its way to prosperity. And what a handicap it had in starting its career after the war! It has just gathered headway, and is fairly moving. Its possibilities are full of promise and hope: its prospects seem brighter than at any period of its existence.

Can such a collection of favorable conditions be found anywhere else? To summarize, they are as follows:

1. General growth along varied and natural lines and on a constantly broadening base.
2. Almost every kind of raw material at hand.
3. A soil with unequalled possibilities as to variety and character of products.
4. A climate unsurpassed.
5. A population almost entirely native American, conservative and full of energy.

On education the hope of the South must rest. Education is the only means of elevating and broadening the individual type. Great attention must be paid to this in order that the best results may be worked out with the unusually favorable materials and resources at hand. The constant elevating of the individual through the process of education is the only means by which the best can be accomplished. The aim of this education must be to create broadness of view and liberality of thought. The South must broaden its base along these lines. Men are needed who will see the public good, and who will stand for it and their convictions. The conservative, honest element must take charge of politics and take an interest in the welfare of the State and municipality.

Legislation should be watched with the greatest care. The South today is in a stage of active growth and development. The laws that may be fitted for older, more settled and more closely populated cities and States will not do for the South today. The rights of capital should be guarded, and it should be treated honestly and justly. Nothing will help the South more today than the reputation that investments made in the Southern States will be protected. The way to develop a country is to pass laws that mean the protection of capital, and the passage of such laws will mean increase of population and increase of taxable values. The broad view of such questions can only be brought about by education. The broadening of the individual and the teaching of the principles of political economy and municipal government are the needs of the day. This means also the broadening and strengthening of character—that is, the production of men, the word being used in its best sense.

If such policy is established, the possibilities for advancement are unlimited. The opportunities for the satisfactory employment of capital are varied and endless. Nature has furnished every material necessity. It but remains for man to take advantage of the situation. No more favorable set of conditions has been or could be created.

If the hand of prudence and wisdom is to a moderate extent applied to the work of nature, the South in the next generation will astonish the most sanguine.

Louisiana's Prospects in 1902

By GOVERNOR W. W. HEARD

The population of the State, according to the census of 1900, is 1,381,625, against 1,118,587 in 1890. This is an increase in the last decade of 263,038, or 23.5 per cent. A notable feature in this movement of population lies in the fact that the whites have come to exceed the colored by more than 78,000. This change is largely due to the influx of immigrants from the North and West and from Europe. It is of good augury, as this desirable influx is expected to continue as long as the large areas of extremely fertile, uncultivated lands in Louisiana remain obtainable at their actual comparatively low prices.

Considering that the total land surface is 45,420 square miles, which is about the same as that of the State of New York, it may be said that there is ample room in Louisiana for eight or ten times its present population.

No other State offers a more varied topography, a greater variety of productions and resources presenting possibilities so vast.

The alluvial regions, including the low swamps and coast lands, cover an area of 20,000 square miles, and the uplands or hill lands, rising from thirty feet above sea-level in South Louisiana to something under 500 feet in North Louisiana, embrace the remainder of the land surface, or about 25,000 square miles. The State has an unequalled system of natural waterways, aggregating over 4000 miles in length, and there are but two or three parishes (counties) which cannot be reached by steamboats. The railways have a total length of more than 2000 miles, not counting sidings or double tracks, and a number of other lines are in construction or projected. So much for the transportation facilities. Manufactures are being established, and the field for many more is nowhere more inviting.

Its chief products are: Cotton, which grows in every part of the State, and gives the greatest average yield per acre, and also the greatest yield upon a single acre, in the entire South. In sugar-cane culture Louisiana stands first in the Union, and she is also the greatest sugar-producing State. The wonderful development of the rice industry in recent years has likewise made Louisiana by far the greatest rice-producing State.

In 1899-1900 the valuation of the production of the State was as follows:

Cotton and by-products	$36,000,000
Sugar and molasses	25,000,000
Rice and by-products	7,000,000
Corn, oats and hay	10,000,000
Fruits, vegetables, live-stock, etc	4,000,000
Total	$82,000,000

It may safely be asserted that 1901 will show an increase of little less than $25,000,000 in these same productions.

In its vast products of pine, cypress, oak, gum, cottonwood, magnolia and other woods the State possesses a wealth that it is difficult to compute. Mammoth lumber mills are now to be found in many localities, and the lumber industries are adding millions annually to the wealth of the State.

The State has 1080 square miles of land-locked bays, 1700 square miles of inland lakes, and a river surface of 500 square miles. These waters afford oyster fisheries surpassing in extent those of any other State, and they are supplying an increasing number of canneries, besides supplying numerous distant and home markets with fish, shrimp, crabs, turtles and other delicacies in great quantities and varieties. It is contended by experts that the fisheries of Louisiana, properly cared for and developed, would yield as large an income as the land productions.

The salt mines in South Louisiana are unrivaled in extent and in the purity of their product. Sulphur is also being mined, and it is of the finest quality. Petroleum in vast deposits is almost a certainty of the near future.

The assessed valuation of property is now $301,215,222, an increase of no less than $24,555,815 over 1900. The bonded debt, the interest upon which is promptly paid, is only $10,877,801.

New Orleans, the metropolis, is now the second largest exporting city in the Union, and her exports for 1900-1901 amounted to $152,911,748, and her imports were considerably more than $21,000,000. The exchanges at her clearing-house aggregated $608,418,307.

The State in 1900 had twenty-one national banks, fifty-eight State and four private banks in operation.

The educational establishment of the State, embracing the public schools, normal school, universities, industrial schools, etc., is on a splendid and growing basis. It will compare favorably with that of many of the larger Commonwealths.

The climate of the State is mild, and it presents no extremes of heat or cold, and in point of healthfulness it will stand comparison with that of any part of the Union.

W. W. Heard

Growth of Foreign Commerce Through South Atlantic and Gulf Ports

By O. P. AUSTIN

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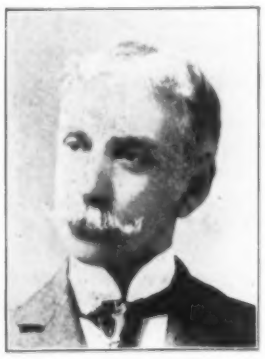
Chief of the Bureau of Statistics, U. S. Treasury Department

The growth of the foreign commerce of the South in the past twenty years has been as remarkable as her development in other business and industrial lines, and has more than kept pace with the phenomenal development which has characterized our national commerce in the meantime. From 1880 to 1901 the exports of the United States increased 74 per cent., while those from the Southern ports alone increased 95.5 per cent. Comparing the export business of the Southern ports with that of all other ports of the United States, the increase from 1880 to 1901 is: Southern ports, 95.5 per cent.; all other ports, 65 per cent. The growth in our export trade in the past twenty years has been the surprise and admiration of the world, yet the Southern ports have not only had their share in the increase, but have actually increased their percentage of the enlarged trade since 1880. The total exports of the United States in 1880 were $853,638,658, and of this total 31 per cent. went through Southern ports. In 1901 the exports were $1,487,764,991, and of this enormously increased total 35 per cent. went through Southern ports.



O. P. Austin.

In the statements relating to the commerce of the Gulf the exports of the ports of Corpus Christi, Saluria and Brazos de Santiago are not included, since those districts, which front upon the Mexican border as well as upon the Gulf, send all of their exports into Mexico by rail or ferry, and make no exportations by tidewater. The district of Paso del Norte, which has sometimes been included under the title of Gulf districts, has no tidewater frontage, its exports passing exclusively into Mexico at El Paso, Texas. In the above term of "Southern ports" are included, therefore, all customs districts on the coast between the northern line of Maryland and the southern line of Texas, exclusive of the above districts of Saluria, Corpus Christi and Brazos de Santiago. They number twenty-three in 1901. In 1880 they numbered twenty-one, Newport News and Tampa having been organized as separate districts since that time. The table which follows shows the exports of each of these districts in 1880, 1885, 1890, 1895, 1900 and 1901:

EXPORTS OF MERCHANDISE FROM SOUTHERN PORTS DURING THE FISCAL YEARS 1880, 1885, 1890, 1895, 1900 AND 1901, SHOWING THE PROPORTION WHICH THEIR IMPORTS FORM OF THE TOTAL IMPORTS INTO THE UNITED STATES.

Ports.	1880.	1885.	1890.	1895.	1900.	1901.
New Orleans	$90,142,019	$79,147,574	$108,126,891	$68,413,362	$115,858,764	$152,776,599
Baltimore	76,253,560	45,052,904	73,983,693	61,938,991	115,530,378	106,239,081
Galveston	16,749,889	12,679,154	24,146,831	41,886,651	85,657,524	101,357,300
Savannah	23,992,364	20,871,446	30,884,451	20,523,760	38,251,981	46,738,967
Newport News	.....	3,131,689	6,958,369	13,469,541	34,758,323	32,567,912
Pensacola	1,930,258	1,968,008	3,451,735	3,042,113	14,413,522	13,455,761
Wilmington	3,941,695	4,425,312	6,934,720	6,590,264	10,975,511	12,013,659
Mobile	7,188,740	3,012,556	3,372,429	5,173,303	13,206,334	11,837,105
Norfolk and ports	14,065,455	14,797,181	14,247,477	7,792,572	13,112,096	10,308,489
Brunswick	966,582	1,570,599	7,757,564	5,164,277	7,373,487	7,952,637
Charleston	19,591,127	18,882,566	13,788,751	10,712,471	7,151,720	7,084,215
Pearl River	268,372	442,513	1,064,461	966,411	1,687,863	2,817,298
Fernandina	262,871	194,800	286,124	1,550,599	2,588,808	1,904,770
Tampa	.....	.....	.....	727,431	1,457,255	1,321,419
Key West	1,052,806	279,722	436,400	964,867	1,395,326	1,033,265
Apalachicola	7,474	263,700	195,747	323,770	424,783	365,782
St. John's	88,115	35,188	41,561	125,845	269,611	204,670
Beaufort, S. C.	1,952,644	856,243	1,140,656	5,777,745	189,908	129,639
Richmond, Va.	2,326,915	2,844,162	8,874,998	2,972,534	.....	17,200
Georgetown, S. C.	41,492	40,498	22,436	14,985	.....	5,500
St. Mark's, Fla.	5,062	2,287	9,485	.....	6,300	.....
St. Mary's, Ga.	66,151	9,100	59,370	27,401	4,944	.....
Pamlico, N. C.	21,037	5,703	17,538	5,690	2,005	.....
Total	$261,214,604	$210,522,905	$306,111,687	$258,164,583	$464,316,943	$510,631,268
Percent. of increase, 1880 to 1901..95.50%						
All other ports	592,424,054	531,666,850	551,716,997	549,373,582	930,166,139	977,133,723
Increase 64.93%						
Grand total, United States	$853,638,658	$742,189,755	$857,828,684	$807,538,165	$1,394,483,082	$1,487,764,991
Increase 74.28%						
Per cent. of total exports formed by Southern ports	30.60	28.36	35.68	31.97	33.29	34.32

It will be seen from an examination of the above table that the drift of the export trade in the period covered by it has been decidedly toward the extreme South, and especially toward the Gulf ports. Baltimore has increased her export trade $30,000,000 in the period; Newport News, $32,500,000; Savannah, $23,000,000; Brunswick, $7,000,000; Wilmington, $8,000,000, and Fernandina, less than $2,000,000; while Norfolk has lost nearly $4,000,000; Beaufort, nearly $2,000,000; Richmond, over $2,000,000, and Charleston has lost $12,000,000—the net increase of the Southern Atlantic ports being about $81,500,000. Turning to the Gulf ports, it will be seen that Galveston increased her exports $85,000,000; New Orleans, $62,000,000; Pensacola, $11,000,000; Mobile, $4,000,000; Pearl River, $2,500,000, and Tampa, about $1,500,000—the total increase of the Gulf ports being about $168,000,000. Thus the Atlantic ports south of the northern line of Maryland have increased their exports since 1880 about $82,000,000, while those of the Gulf have increased about $168,000,000, or more than double that of the Atlantic ports in question. The Gulf ports have increased their exports about 143 per cent., while those of the South Atlantic have increased about 57 per cent. during the period under consideration. If we pursue the analysis still further it will be seen that most of the enormous increase which the Gulf ports have made is in the western part of the Gulf, the point farthest removed from the European markets, for which the bulk of our exports are destined. Of the increase of $170,000,000 in the Gulf ports, $147,000,000 should be credited to New Orleans and Galveston alone.

In a word, it may be said that the Southern ports as a whole have increased their exports 95.5 per cent., while the other parts of the country have increased theirs but 65 per cent.; but that of the Southern ports, those on the Atlantic coast have increased but 56.8 per cent., while those on the Gulf have increased 142.7 per cent. In 1880 $117,644,620, or 13.8 per cent. of the total exports, sought tidewater at the Gulf ports; in 1901 $285,464,529, or 19.2 per cent. of the total exports, reached tidewater at the Gulf ports. The total exports of the country have increased 74.28 per cent. between 1880 and 1901, while those of the Gulf ports alone have increased 142.7 per cent., or at a rate of increase nearly double that for the country as a whole.

What is the cause of this great growth in the business of the Gulf ports, and especially those of the western part of the Gulf? The answer is not difficult. The great grain fields and the stock farms which furnish a large share of the exports of the country have moved farther west, and in doing so have found themselves nearer to the Gulf than to the Atlantic seaboard. When the principal grain region lay east of the Mississippi and spring wheat was the chief agricultural product exported, it sought the seaboard by the lakes and the railway lines which parallel and supplement that magnificent waterway. It was found, however, that Illinois, Iowa, Nebraska, Kansas and Missouri could raise winter wheat much more successfully than the spring wheat which they had formerly grown, and they increased their wheat production materially. It was also found that they could market from $50,000,000 to $75,000,000 worth of corn a year in Europe, and that by feeding their corn to hogs and cattle they could find a ready market for all that they could produce. As a result the great middle Mississippi valley became an enormous producer of wheat, corn and meats, which sought the European markets. With this great increase in the middle Mississippi valley of articles seeking the European market came a realization by the capitalists and railway managers of the country that not only were these great fields, many of them, nearer to the Gulf than to the Atlantic, but that there would be no mountains to cross in carrying their products to the Gulf. The result was a rapid increase in the number of railway lines toward the South, and especially in the States immediately west of the Mississippi river. Between 1880 and 1900 the railways of the South increased in mileage from 21,612 miles to 52,594, an increase of 143 per cent., while those of the other States and Territories of the Union grew from 71,650 miles to 141,727, an increase of but 98 per cent.

The following table shows the railways in operation in the South and in the entire country in 1880, 1890, and each year from 1896 to 1900:

RAILWAYS IN THE SOUTHERN STATES, 1880, 1890, 1896-1900.

Southern States.	1880. Miles.	1890. Miles.	1896. Miles.	1897. Miles.	1898. Miles.	1899. Miles.	1900. Miles.
Maryland	1,020	1,270	1,320	1,313	1,325	1,339	1,339
District of Columbia	20	21	23	25	25	25	25
Virginia	1,893	3,560	3,599	3,629	3,675	3,721	3,795
West Virginia	691	1,433	2,094	2,161	2,199	2,230	2,485
North Carolina	1,486	3,128	3,454	3,478	3,573	3,656	3,733
South Carolina	1,427	2,289	2,655	2,666	2,655	2,792	2,919
Georgia	2,459	4,601	5,289	5,414	5,543	5,598	5,730
Florida	518	2,490	3,139	3,149	3,102	3,234	3,256
Kentucky	1,530	2,942	3,081	3,086	3,086	3,083	3,094
Tennessee	1,843	2,767	3,110	3,107	3,039	3,131	3,185
Alabama	1,843	3,422	3,681	3,807	3,906	4,051	4,197
Mississippi	1,127	2,471	2,553	2,645	2,691	2,788	2,934
Louisiana	652	1,740	2,256	2,271	2,519	2,664	2,801
Texas	3,244	8,710	9,492	9,565	9,658	9,722	9,992
Arkansas	859	2,203	2,526	2,631	2,823	3,088	3,109
Total South	21,612	45,047	48,272	49,047	49,849	51,122	52,594
Other States and Territories	71,650	121,656	134,237	135,556	137,003	139,696	141,727
Total United States	93,262	166,703	182,509	184,603	186,852	190,818	194,321
Increase of Southern States, 1880 to 1900							143%
Increase of other States, 1880 to 1900							98%
Increase of entire United States, 1880 to 1900							108%

One other measure of the relative growth of the exports of the Gulf and Atlantic ports is found in the following table, which shows the tonnage of the vessels engaged in the foreign trade which cleared from each of the principal Southern ports in 1880, 1890, 1895 and 1901. It will be seen from an examination of its figures, port by port, that while the tonnage of the South Atlantic ports shows the healthy increase of about one and one-half million tons (1,514,400), those of the Gulf ports show an increase of nearly three millions (2,994,740 tons). The South Atlantic ports show an increase of 70 per cent. during the period 1880-1901, while those of the Gulf show an increase of 213 per cent. during the same time:

TONNAGE OF VESSELS ENGAGED IN THE FOREIGN TRADE CLEARED FROM PRINCIPAL SOUTHERN PORTS, 1880, 1890, 1895 AND 1901.

Ports.	1880.	1890.	1895.	1901.
Baltimore	1,491,060	845,239	977,350	1,758,573
Brunswick, Ga	105,435	146,275	183,258	235,305
Charleston, S. C	148,218	86,710	107,139	38,044
Newport News	.....	73,751	278,768	645,071
Norfolk, Va	118,880	84,850	156,648	561,722
Richmond	45,741	17,721	25,016	1,052
Savannah	170,092	246,626	300,451	377,929
Wilmington	95,099	75,135	88,169	71,229
Galveston	99,007	173,473	399,891	742,008
Key West	96,747	127,191	95,274	350,545
Mobile	69,181	126,576	271,481	534,402
New Orleans	858,765	1,019,522	997,996	1,948,234
Pearl River	28,414	129,114	121,364	185,698
Pensacola	253,291	395,702	352,607	529,192
Tampa	.....	4,540	91,499	110,066

It must not be assumed, however, that all of the increase in the exports from the Southern ports is due to the southward drift of the products of the great grain and provision area of the Mississippi valley. The South itself has greatly increased its production of articles for the foreign market for the period under consideration. The value of the cotton exported in 1880, for instance, was $211,000,000, and in 1901 was $313,000,000, while the share which went through Southern ports increased from 78 per cent. in 1880 to 82 per cent. in 1901. In the single item of cotton, therefore, the value of the exports through Southern ports was in 1901 about $100,000,000 in excess of that of 1880. Cottonseed-oil exportations increased from $3,000,000, in round terms, in 1880 to $16,500,000 in 1901, and naturally a large share of this went through Southern ports. Fertilizers, chiefly Southern phosphate, exported in 1880 amounted to less than $1,000,000, and in 1901 were over $5,000,000 in value, and exportations of oilcake and meal, which amounted to about $6,000,000 in 1880, were over $18,000,000 in 1901, of which value $13,000,000 represented cottonseed cake and meal. Mules, chiefly a Southern product and mostly exported through New Orleans, have increased about $3,000,000 in exportations since 1880. Naval stores, nearly all of which are produced in the South, increased over $10,000,000 in exportations during the period under review. The exports of wood and its manufactures increased over $30,000,000 from 1880 to 1901, and a considerable share of this was from the Southern forests and factories. Tobacco exports of all kinds increased about $14,000,000, and in this increase the South had a large part. The enormous increase in the exportations of copper, iron and steel is well known, and a considerable share of this went by way of Baltimore, while some consignments of steel rails and other iron and steel manufactures went by way of the Gulf ports in recent years. In other manufactures the Southern ports have gained materially, especially Baltimore and those through which manufactures now pass to the West Indies.

It is, however, in the southward drift of the products of the Mississippi valley that the greatest interest centers. Naturally, the Southern ports would be the chief beneficiaries from the increase in Southern exportations, but when they become the rivals of the Atlantic ports in handling the products of the Mississippi valley, the movement is worthy of careful study. For this purpose a series of tables has been prepared showing the exports from all the Southern ports of wheat, flour, corn, lard, hams, bacon and cotton in 1880, 1890, 1895 and 1901. In addition to these general tables, which include all Southern ports, there are presented special statements showing the local movements in each year at certain ports of the articles in which the greatest change has taken place. They are as follows:

EXPORTS OF WHEAT FROM SOUTHERN PORTS OF THE UNITED STATES, 1880, 1890, 1895 AND 1901.

Ports.	1880. Bushels.	1890. Bushels.	1895. Bushels.	1901. Bushels.
New Orleans, La	3,922,632	2,433,529	1,860,642	15,078,322
Baltimore, Md	34,162,701	6,363,376	7,679,975	7,857,768
Galveston	.....	.....	53,055	14,010,378
Newport News Va	.....	135,451	2,973,974	1,870,785
Pensacola, Fla	.....	.....	.....	435,845
Mobile, Ala	.....	.....	2	75,662
Norfolk and Portsmouth	.....	2,982	217,193	199
Saluria, Texas	.....	.....	.....	1,638
Beaufort, S. C	.....	.....	50,000	.....
Richmond, Va	143,701	.....	.....	.....
Tampa, Fla	.....	.....	.....	83
Total Southern Ports	38,229,034	8,935,338	12,834,841	39,330,680
Total United States	153,252,795	54,387,767	76,102,704	132,060,667
Per cent. through Southern ports.	24.94	16.44	16.86	29.80

EXPORTS OF WHEAT FROM NEW ORLEANS AND GALVESTON, 1895 TO 1901.

	From New Orleans. Bushels.	From Galveston. Bushels.	From United States. Bushels.
1895	1,860,642	53,055	76,102,704
1896	1,149,108	20,834	60,650,080
1897	3,133,192	3,499,482	79,562,029
1898	16,908,287	10,619,995	148,231,261
1899	12,374,697	14,252,037	139,432,815
1900	8,330,672	13,561,839	101,950,389
1901	15,078,322	14,010,378	132,060,667

EXPORTS OF FLOUR FROM SOUTHERN PORTS OF THE UNITED STATES, 1880, 1890, 1895 AND 1901.

Ports.	1880. Barrels.	1890. Barrels.	1895. Barrels.	1901. Barrels.
New Orleans, La	51,766	44,219	114,281	598,281
Baltimore, Md	453,418	3,001,225	2,624,749	3,098,376
Galveston, Texas	228	6,111	66,921	120,357
Savannah, Ga	505	621	25	1,188
Newport News, Va	.....	277,220	1,131,040	2,443,475
Pensacola, Fla	.....	1,853	69,735	21,516
Wilmington, N. C	50	7	80	.....
Mobile, Ala	216	3,405	13,162	285,726
Norfolk and Portsmouth	12	3,949	64,367	433,410
Brunswick, Ga	834	490	1,047	3,276
Charleston, S. C	317	.....	75	.....
Fernandina, Fla	12	.....	.....	.....
Tampa, Fla	.....	.....	40	11,400
Key West, Fla	43,500	49,681	52,185	1,811
St. John's, Fla	29	197	1,345	426
Beaufort, S. C	.....	.....	77,783	.....
Richmond, Va	161,949	76,332	2,602	.....
Pearl River, Miss	.....	.....	72	.....
Pamlico, N. C	.....	40	.....	.....
St. Augustine, Fla	.....	.....	690	.....
Total Southern ports	712,866	3,465,350	4,220,199	7,019,242
Total United States	6,011,419	12,231,711	15,268,892	18,650,979
Per cent. through Southern ports	11.85	28.33	27.64	37.63

EXPORTS OF FLOUR FROM NEWPORT NEWS AND NORFOLK, 1890 TO 1901.

	Newport News. Barrels.	Norfolk and Portsmouth. Barrels.	United States. Barrels.
1890	277,220	3,949	12,231,711
1891	490,272	1,480	11,344,304
1892	995,822	104,577	15,196,769
1893	706,681	120,640	16,620,329
1894	796,406	70,569	16,859,533
1895	1,131,040	64,367	15,268,892
1896	1,235,981	16,759	14,620,864
1897	1,668,441	105,279	14,569,545
1898	1,730,085	26,819	15,349,943
1899	1,691,353	163,629	18,485,690
1900	2,081,252	481,302	18,699,194
1901	2,443,475	433,410	18,650,979

EXPORTS OF CORN FROM SOUTHERN PORTS OF THE UNITED STATES, 1880, 1890 AND 1901.

Ports.	1880. Bushels.	1890. Bushels.	1895. Bushels.	1901. Bushels.
New Orleans, La	8,039,417	14,990,418	2,572,362	20,948,253
Baltimore, Md	17,494,878	23,089,139	4,843,139	40,832,420
Galveston, Texas	.....	35,503	.....	109
Savannah, Ga	20	63	.....	588
Newport News, Va	.....	1,240,577	3,393,625	6,096,815
Pensacola, Fla	.....	.....	142,547	112,308
Wilmington, N. C	.....	.....	94	.....
Mobile, Ala	1,212	11,739	65,085	1,085,885
Norfolk and Portsmouth, Va	216,861	31,728	1,861,100	4,153,079
Brunswick, Ga	128	23	2,336	127
Key West, Fla	107,793	348,252	24,298	.....
St. John's, Fla	25	2	.....	3,118
Beaufort, S. C	.....	.....	85,000	.....
Richmond, Va	604,408	.....	.....	.....
Pamlico, N. C	100	56	.....	.....
St. Augustine, Fla	.....	.....	40	.....
Total Southern ports	26,464,842	39,747,500	12,989,626	73,232,593
Total United States	98,169,877	101,973,717	27,691,137	177,817,965
Per cent. through Southern ports	26.96	39.07	46.90	41.80

EXPORTS OF CORN FROM PRINCIPAL SOUTHERN PORTS, 1890 TO 1901.

	New Orleans. Bushels.	Baltimore. Bushels.	Newport News. Bushels.	Norfolk and Portsmouth. Bushels.	Mobile. Bushels.	United States. Bushels.
1890	14,990,418	23,089,139	1,240,577	31,728	11,739	101,973,717
1891	3,051,557	4,389,183	802,551	22,794	.....	30,768,213
1892	7,442,523	18,625,755	932,570	638,225	433	75,451,849
1893	4,077,942	6,524,162	1,546,091	429,519	15,435	46,037,274
1894	7,968,460	10,343,329	5,610,976	1,056,064	4,261	65,324,841
1895	2,572,362	4,843,139	3,393,625	1,861,100	65,085	27,691,137
1896	19,676,703	17,075,017	8,154,631	8,013,044	843,035	99,992,835
1897	30,322,058	40,255,878	14,778,151	13,805,522	2,580,677	176,916,365
1898	23,109,296	44,920,551	16,367,517	11,847,956	2,121,131	208,744,939
1899	14,637,145	40,422,310	10,989,198	5,965,645	1,034,516	174,089,094
1900	28,333,675	45,723,860	14,355,096	5,118,011	1,571,040	209,348,284
1901	20,948,253	40,832,420	6,096,815	4,153,079	1,805,885	177,817,965

EXPORTS OF LARD FROM SOUTHERN PORTS, 1880, 1890, 1895 AND 1901.

Ports.	1880. Pounds.	1890. Pounds.	1895. Pounds.	1901. Pounds.
New Orleans, La	573,419	311,980	726,216	10,447,336
Baltimore, Md	31,419,548	62,213,033	74,016,846	97,419,095
Galveston, Texas	.....	10,700	412	97,140
Savannah, Ga	.....	12,059	.....	24,000
Newport News, Va	.....	6,044,664	9,162,597	23,853,077
Pensacola, Fla	.....	.....	342,127	496,222
Mobile, Ala	6,404	31,180	181,993	9,414,541
Norfolk and Portsmouth	.....	.....	129,500	1,591,938
Brunswick, Ga	4,297	163	.....	250
Charleston, S. C	401	.....	.....	.....
Fernandina, Fla	2,050	.....	.....	.....
Key West, Fla	11,113	45,384	160,936	69,899
St. John's, Fla	.....	545	1,915	24,791
Richmond, Va	35,352	30,676	.....	.....
St. Augustine, Fla	.....	.....	1,970	.....
Pearl River, Miss	.....	16,945	.....	.....
Total Southern ports	32,052,584	68,717,329	84,724,512	143,438,289
Total United States	374,979,286	471,083,598	474,895,274	611,357,514
Per cent. through Southern ports.	8.55	14.58	17.84	23.44

EXPORTS OF LARD FROM PRINCIPAL SOUTHERN PORTS, 1895-1901.

	Baltimore. Pounds.	Newport News. Pounds.	Mobile. Pounds.	Norfolk. Pounds.	New Orleans. Pounds.	United States. Pounds.
1895	74,016,846	9,162,597	181,993	129,500	726,216	474,895,274
1896	80,643,159	19,734,170	111,416	137,800	12,019,305	509,534 256
1897	83,837,528	30,084,089	1,191,489	32,662,303	31,482,141	568,315,640
1898	142,290,379	26,714,884	614,989	36,741,513	12,753,233	709,344,045
1899	108,942,288	19,535,776	1,628,447	39,092,737	5,685,711	711,259,851
1900	114,090,555	33,170,131	8,429,343	18,252,377	6,372,626	661,813,663
1901	97,419,095	23,853,077	9,414,541	1,591,938	10,447,336	611,357,514

EXPORTS OF HAMS FROM SOUTHERN PORTS, 1890, 1895 AND 1901.

Ports.	1890. Pounds.	1895. Pounds.	1901. Pounds.
New Orleans, La	100,484	115,389	1,254,528
Baltimore, Md	1,627,799	2,118,955	8,396,967
Galveston, Texas	.....	324	1,000
Savannah, Ga	1,541	451	7,870
Newport News, Va	.....	14,674	22,907
Pensacola, Fla	.....	20,511	33,645
Mobile, Ala	651	41,960	2,745,276
Brunswick, Ga	1,200	.....	396
Charleston, S. C	3,500	1,035	511
Key West, Fla	12,498	92,544	14,548
St. John's, Fla	275	829	6,968
Pearl River, Miss	592	.....	.....
Total Southern ports	1,748,540	2,406,672	13,084,616
Total United States	76,591,279	105,491,123	216,571,803
Per cent. through Southern ports	2.29	2.28	6.04

EXPORTS OF HAMS FROM PRINCIPAL SOUTHERN PORTS, 1895-1901.

	Baltimore. Pounds.	New Orleans. Pounds.	Mobile. Pounds.	United States. Pounds.
1895	2,118,955	115,389	41,960	105,494,123
1896	1,688,641	165,114	38,640	129,036,351
1897	1,968,357	203,226	63,183	165,247,302
1898	7,575,369	195,955	69,053	200,185,861
1899	12,622,804	221,581	702,684	225,846,750
1900	18,722,446	931,173	1,386,523	196,414,412
1901	8,396,967	1,254,528	2,745,276	216,571,803

EXPORTS OF BACON FROM SOUTHERN PORTS, 1890, 1895 AND 1901.

Ports.	1890. Pounds.	1895. Pounds.	1901. Pounds.
New Orleans, La	78,354	169,100	1,166,624
Baltimore, Md	10,387,370	16,467,715	22,482,718
Galveston, Texas	.....	660	.....
Savannah, Ga	630	.....	2,300
Newport News, Va	1,812,817	74,639	.....
Wilmington, N. C	1,000	900	.....
Mobile, Ala	62,769	20,835	3,767
Brunswick, Ga	5,478	.....	216
Charleston, S. C	.....	.....	1,229
Key West, Fla	1,980	.....	11,469
St. John's, Fla	4,361	2,460	.....
Richmond, Va	1,350	.....	.....
St. Augustine, Fla	.....	400	.....
Pearl River, Miss	7,204	.....	.....
Total Southern ports	12,364,094	16,736,709	23,668,323
Total United States	531,889,677	452,549,976	456,122,741
Per cent. through Southern ports	2.32	3.70	5.19

EXPORTS OF BACON FROM BALTIMORE AND NEW ORLEANS, 1895 TO 1901.

	Baltimore. Pounds.	New Orleans. Pounds.	United States. Pounds.
1895	16,467,715	169,100	452,549,976
1896	13,312,707	271,415	425,352,187
1897	31,821,861	225,156	500,399,448
1898	71,615,448	343,145	650,108,933
1899	53,474,517	357,373	562,651,480
1900	41,361,933	1,902,633	512,153,729
1901	22,482,718	1,166,624	456,122,741

EXPORTS OF COTTON FROM SOUTHERN PORTS OF THE UNITED STATES, 1880, 1890, 1895 AND 1901.

Ports.	1880. Pounds.	1890. Pounds.	1895. Pounds.	1901. Pounds.
New Orleans, La	659,208,145	901,507,043	1,044,159,111	1,015,882,690
Baltimore, Md	55,255,769	61,204,842	137,800,452	78,591,622
Galveston, Texas	147,624,542	241,259,606	717,840,939	899,884,174
Savannah, Ga	205,100,016	258,420,192	264,205,747	377,425,978
Newport News, Va	.....	18,901,931	17,374,371	14,846,018
Pensacola, Fla	.....	.....	150,000	72,790,264
Wilmington, N. C	17,140,085	54,746,591	99,964,853	110,184,813
Mobile, Ala	57,093,556	22,271,322	60,766,588	27,463,102
Norfolk and Portsmouth	119,982,379	128,258,207	93,962,642	11,032,528
Brunswick, Ga	.....	56,413,530	50,972,939	49,227,730
Charleston, S. C	146,514,380	115,116,750	166,705,983	67,561,364
Fernandina, Fla	243,646	.....	.....	1,405,614
Apalachicola, Fla	.....	60,978,275	.....	.....
Beaufort, S. C	13,563,277	.....	77,909,264	301,111
Richmond, Va	689,502	85,462,751	55,543,352	.....
Total Southern ports	1,422,355,297	2,004,541,040	2,787,356,232	2,726,597,018
Total United States	1,822,061,114	2,471,799,853	3,517,433,109	3,330,890,448
Per cent. through Southern ports	78.06	81.09	79.24	81.86

COTTON CLOTHS (Colored and Uncolored).

Ports.	1880. Yards.	1890. Yards.	1895. Yards.	1901. Yards.
New Orleans, La	402,420	564,492	729,104	1,207,119
Baltimore, Md	251,164	245,670	729,465	949,516
Galveston, Texas	5,797	.....	.....	.....
Savannah, Ga	58,150	28,690	.....	17,041
Newport News, Va	.....	.....	17,934	.....
Pensacola, Fla	.....	.....	3,979	5,000
Charleston, S. C	4,000	.....	.....	.....
Mobile, Ala	63,759	36,637	636,705	2,501,940
Tampa, Fla	.....	.....	.....	5,830
Key West, Fla	.....	.....	562	58,416
St. John's, Fla	.....	.....	6,928	12,662
Teche, La	5,413	172,850	.....	.....
Pearl River, Miss	.....	.....	1,247	2,643
Total Southern ports	790,703	1,048,339	2,125,924	4,760,167
Total United States	106,579,723	118,026,260	184,258,061	251,503,351
Per cent. through Southern ports	.74	.89	1.15	1.89

EXPORTS OF COTTON CLOTH FROM MOBILE, ALA., 1890 TO 1901.

	Colored. Yards.	Uncolored. Yards.	Total United States. Yards.
1890	2,250	34,387	18,092,925
1891	.....	54,386	274,546,272
1892	4,000	57,354	183,654,321
1893	14,920	49,342	143,792,114
1894	46,047	64,361	185,887,736
1895	322,273	314,432	184,258,061
1896	209,069	323,993	225,139,368
1897	500,625	460,165	313,583,044
1898	542,391	461,434	270,507,818
1899	868,976	611,688	412,004,055
1900	1,471,366	775,734	352,194,989
1901	1,624,622	877,318	251,503,351

A study of these tables is interesting not only as showing the general increase which the Southern ports have made in handling the products of the Mississippi valley, but as showing that certain of the great productions find such marked advantages in the Gulf ports that they are abandoning such South Atlantic ports as Baltimore, Norfolk and Charleston, and seeking the ports on the Gulf. Wheat, it will be seen, has fallen off 25,000,000 bushels at Baltimore since 1880, and increased 25,000,000 bushels at New Orleans and Galveston during that time, while even Newport News shows a smaller total in this particular in 1901 than in 1895. Corn has increased 150 per cent. at New Orleans, while it has increased about 130 per cent. at Baltimore. In flour the Gulf ports show no great increase during the period under consideration, the principal milling points being so far at the North as to make the Atlantic seaboard its most convenient point for reaching tidewater. The share of these three articles passing out of the country through Southern ports as a whole, however, has greatly increased since 1880. In that year 25 per cent. of the wheat, 12 per cent. of the flour and 27 per cent. of the corn exported passed through Southern ports. In 1901 30 per cent. of the wheat, 38 per cent. of the flour and 42 per cent. of the corn was sent out from Southern ports. In cotton cloth, although the South has largely increased its production, the share of the total exports which passed through Southern ports is still small, having been in 1880 less than 1 per cent., and in 1901 less than 2 per cent. In bacon, hams and lard the movement through the Gulf ports is still apparently small, the chief growth having been on the Atlantic coast, Baltimore showing a larger growth in these articles than does any other port classed as Southern.

On the import side the increase through Southern ports is less apparent. This is due in part to the fact that the general growth in imports has been much less than that in exports, and in part to the fact that a large number of interior cities have since 1880 been designated as ports of entry, to which merchandise is forwarded without appraisement at the original port of entry. As a consequence, a considerable portion of the merchandise now arriving at and passing through the districts located on the coast is not shown in the receipts of those ports. The total value of merchandise forwarded from the ports of first arrival to interior ports during the year 1901 was $56,573,061. Among the interior ports to which this $56,573,061 worth of foreign goods was sent for distribution were Atlanta, Cincinnati, Knoxville, Louisville, Memphis, Nashville, St. Louis, St. Joseph, Mo.; San Antonio, Texas, and Durham, N. C. The value of the imports forwarded direct to interior ports through the tidewater ports of the South in 1900 was: Baltimore, $2,397,948; Newport News, $5,591,306; Norfolk and Portsmouth, $4271; Galveston, $24,854; Key West, $397,726; Mobile, $5720; New Orleans, $2,194,765, and Tampa, $17,456.

O. P. Austin.

Ten Years of Railway Progress

By M. E. INGALLS,

President of the Cleveland, Cincinnati, Chicago & St. Louis Railroad

You ask me for a few words upon the railway progress of the South during the last twenty years. If I took the twenty years it would be such an enormous increase and improvement that it might look fabulous, and therefore I have taken the last ten years. This suits my convenience better, as I was somewhat familiar from 1890 to 1900 with the development in the Southeastern country from my connection with the Chesapeake & Ohio Railway, and these few general statements apply to that territory.

The mileage in the Southeastern country has increased in the ten years about 40 per cent.; the number of locomotives about the same percentage, but in capacity it has more than doubled. Passenger equipment has increased practically the same percentage. In freight equipment the increase is about 100 per cent. in number, and in capacity probably 200 per cent. This shows what tremendous strides the railways have made in procuring equipment to take care of the business of this part of the country. In giving the mileage I have given main track. If I had the statistics of siding for the passage of trains and for the accommodation of the commercial business, I have no doubt it would show much larger results.

The gross earnings of the railways in this section in the ten years have increased from $60,000,000 to $105,000,000 (I give round numbers). Seventy-five per cent. of this enormous increase is all practically paid out in the South for labor and material, as two-thirds of the earnings are used in operating expenses, and then, in addition, taxes take up probably 5 per cent. more. The net earnings of railways in this section have increased from $21,000,000 to $35,000,000 in the ten years.

Nearly all the small railways have been absorbed by three or four large systems, and these companies have improved their facilities and accommodated the public, and are reaping their reward in a large increase of net earnings.

These figures are suggestive, but they can convey no idea to the mind of the ordinary reader of the improvement that has taken place in the physical condition and the actual earning capacity of the Southern railways. Some of us who traveled in the South previous to 1890 and who have visited it since 1900 can hardly reconcile in our minds the thought that it is the same country and the same right of way, but so different. Where there used to be old and worn-out wooden bridges, permanent structures of stone and iron have been constructed. Steel rails in the track have increased from fifty-six pounds to seventy-five and eighty pounds in the yard; ballast has taken the place of mud; clean-kept tracks have replaced the old slovenly condition.

If there is anything on earth that represents the New South today it is the railways of the Southeastern country. In physical condition, in management, in facilities for the public, they compare favorably with any section of the country. Ten years ago they were, in many cases, a broken-down and disjointed lot, unable to serve the public or themselves.

If anyone has any doubt of the truth of these statements, let him ride over any of the systems between Washington and Cincinnati on the north, New Orleans and Jacksonville on the south, or of the cross lines from the Mississippi to the seaboard, and he will find the truth of my statements.

M. E. Ingalls

Southern Timber Resources

By B. E. FERNOW,

Director of The New York State College of Forestry

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In 1895 the writer, being in charge of the forestry department of the Cotton States and International Exposition held at Atlanta, compiled, for the purpose of exhibiting them in graphic manner, statistics of the lumber production in the Southern States. A column built up of blocks of the various woods which participated in this production in relative sizes represented the result of this canvass. The means for securing such statistics were mainly a directory of saw-mills, compiled some time before by the Northwestern Lumberman, giving the daily capacity of each mill. This gave a basis for computing the *probable* actual output of the mills, which was then checked by correspondence with persons who might have judgment as to the probabilities, and in this way a table was constructed which would give a picture of the relative amounts or values in which the different species and States participate to make the total result of lumber and wood production.

B. E. FERNOW.

The column or pyramid which exhibited the result had as its base a block containing 300 cubic feet, representing the entire amount of wood of all kinds for all purposes, fuel, fencing, railroad ties, etc., included, which the Southern States derive from their forest properties for every second in the year, indicating an annual consumption of round 10,000,000,000 cubic feet of wood. A small block of forty-eight cubic feet contents was placed on this, representing the total product per second of all log timber, indicating an annual output for all kinds of 1,500,000,000 cubic feet of logs, corresponding to about 10,000,000,000 feet, B. M. Above this base the blocks made of different species exhibited the relative participation of the same in the total saw material. The proportions for the yearly cut appeared as follows:

	M. feet, B. M.
Long-leaf pine	4,000,000
Short-leaf and loblolly pine	3,000,000
Oak	2,000,000
Poplar	500,000
Cypress	500,000
Cottonwood	250,000
Ash	225,000
Hickory	150,000
Red gum	35,000
Walnut	10,000
Cherry	10,000
Red cedar	10,000
All other	10,000
	10,700,000

With the same basis of information an estimate was also made as to the participation of each State in this production, and the two base blocks were divided by lines so that this relation might be noted. Beginning with the State which furnished the largest amount, this relation, which must not be construed mathematically, appeared as follows:

For wood of all kinds.	For log timber alone.
Tennessee.	Tennessee.
Kentucky.	Georgia.
North Carolina.	Kentucky.
Alabama.	Alabama.
Georgia.	North Carolina.
Texas.	West Virginia.
Mississippi.	Arkansas.
Arkansas.	Mississippi.
Missouri.	Louisiana.
South Carolina.	Texas.
West Virginia.	Missouri.
Louisiana.	Florida.
Florida.	South Carolina.

In the same year (1895) the writer also compiled a table which gives an estimate of the lumber cut of different species and in different regions over the whole United States, which, for the sake of comparison, may be here repeated with advantage:

ESTIMATED LUMBER CUT IN THE UNITED STATES.*

Regions.	M. feet, B. M.	Kinds.	M. feet, B. M.
New England and North Atlantic States	6,000,000	White pine	12,000,000
Central States (hardwoods)	5,000,000	Spruce and fir	5,000,000
Lake Regions (mostly pine)	13,000,000	Hemlock	4,000,000
Southern Coast (mostly pine)	10,000,000	Long-leaf pine	4,000,000
Pacific Coast	4,000,000	Short-leaf and loblolly pine	3,000,000
Miscellaneous	2,000,000	Cypress	500,000
		Redwood	500,000
		All other conifers	1,000,000
		Oak	3,000,000
		All other hardwoods	7,000,000
	40,000,000		40,000,000

*Published first in "One Hundred Years of American Commerce"—"American Lumber," by B. E. Fernow.

This table was reprinted last year (without credit) by the Lumber Trade Journal of New Orleans as representing the estimated lumber cut for the year 1899, whereupon another trade journal, having found out the author of the table, desired to have a statement made for the year 1900.

This is, indeed, mistaking entirely the character and value of such statistics, for they are only approximations to describe the general condition of things, and their relative value prevailing during a shorter or longer period, without taking care of any annual changes.

For such a purpose, namely, to exhibit relative position of the single items, these estimates are, if carefully and circumspectly made, indeed better than census figures, which, pretending to be enumerations, what in reality they are not, furnish no means of determining what proportion these establishments represent which have failed to report. In this respect the statistics of the eleventh census were, indeed, so poor for the Southern States, owing to the indisposition of Southern mills to answer inquiries, that they could not be used for any purpose. The above calculations, then, are as near an approach to the truth in 1890 as in 1900, and no one can make any better without a new canvass of the greatly increased mill capacity or other exhaustive inquiry.

From these rough statements, however, we can derive the general truth that the South furnishes so far but little over one-quarter of the total lumber product of the country, a proportion which in later years has probably increased to nearer one-third; but if we consider only the most valuable, because most widely used, part of the product, namely, the pines, the South now furnishes probably near one-half of our consumption, and with the exhaustion of the white pine, which is now visible even to those who but a few years ago derided us who predicted this result in the near future as "denudatics," this call for pine must necessarily grow.

We learn, further, that even now, or at the time when our estimates applied, the log output of conifers was three-quarters of the total output in the South, the pines representing two-thirds, while of the hardwood output more than one-half was oak. These figures also make us realize that of all the wood cut in the South, not more than 15 per cent. is log timber, showing the extensive reliance of the population on wood for fuel.

If we were to attempt a valuation of this annual harvest at the centers of consumption, the very lowest figures would bring the value of the lumber product to over $100,000,000, a sum greater than any other single line of products, save the agricultural crops, of the South; and if we add the value of the naval-stores industry, with $8,000,000, and estimate the value of fencing, ties, tanbark and other minor materials derived from the forest resources at round $200,000,000 (which would make the value of a cord of any description, delivered anywhere, at $2), we find that this wood product approximates closely in value the greatest product of the South, the cotton crop, which during the decade to which we refer averaged $316,000,000.

This comparison should wake up all our citizens of the South to a realization of the importance and value of this forest resource, which they have hitherto treated with the same neglect as their Northern brethren. The bulk of the timber lands of value, to be sure, are probably by this time in the hands of these very brethren, who have depleted the merchantable white pine and have turned their eyes Southward for further supplies to continue their lucrative business of forest exploitation.

On the manner in which the further exploitation of the Southern forests is carried on by their owners will depend the question whether this source of wealth is to flow continuously or is only to be robbed of what nature had bountifully provided. If it is difficult to approximate for any period, let alone a definite year, the amount of wood production, it is still more difficult, or well-nigh impossible, to approximate the amount of timber standing which is of merchantable quality. If, therefore, the writer has ventured the guess that 2,000,000,000,000 feet, B. M., might still be found in the United States immediately available, and has credited of this amount 700,000,000,000 feet to the Southern States, he would not wish to be held responsible for a deficiency occurring in less than fifty to sixty years, which a comparison of the supplies with the estimated annual cut would indicate as the end of natural supplies on hand at present. Such estimates and comparisons are only useful to bring out into more relief and definiteness a tendency, a possibility of result.

With decrease of supplies comes economy in their use, and, on the other hand, standards of usefulness are reduced, the diameter of the merchantable log sinks, as it did with the white pine, from twelve inches in 1880, to five inches at the present time. By this last change an estimate of supplies becomes quickly wrong, but, in addition, also does the future of the resource suffer, for, as the smaller sizes are being cut or culled, the time of recuperation is delayed. We do not bring forward these figures for any commercial use, but for the general economic aspect which they present of the apparent fate of our forest resources.

It is forest management, *harvesting with provisions for re-growth*, that alone will insure to the South a continuance of this source of wealth. The writer is glad to learn that owners of large forest areas in the South are taking advantage of the paternal offer of the United States bureau of forestry to make so-called "working plans" for such forest management. Unfortunately, as these plans appear to be much less concerned with reproduction of the crop, but rely mainly upon a reduction of the cut which the owner is to make in his harvest, I fear that many of the owners will figure differently from the working plan, believing that the dollar they can take now is better than the two in the future. Not until silviculture, the pivotal art of the forester—systematic reproduction by skillful methods of the forester under competent hands—is begun, can we hope much for the future.

The South, with its favorable climate, with its large extent of mountainous and of sandy areas, the forest sites par excellence, is the very best portion of our domain where to practice silviculture. That the valuable pineries are rapidly coming into the hands of large capitalists and corporations can only be considered hopeful if these owners can be educated to realize the advantage of forest management for continuity, for large capital and large area are the first requisites for successful forestry practice.

If the Southern people know their interest they will not object to have their forest resources fall into the hands of large capitalists or trusts, but they will

so guard by wise legislation their own interests in the management of these resources that the advantages of such large holdings come to them without the disadvantages, which it is not necessary to allow to grow up. It is worth the deepest thought of the best statesmen to formulate such legislation that shall not be inimical to the commercial interests of the owners, and yet protect the more important interests of the community in the perpetuation of this source of wealth. In fact, if trusts can be managed so as to be beneficial, here in forest management the writer believes is a field on which their own benefit and that of the people may be secured at the same time by managing large properties for continuous revenue.

Conservative management is especially indicated in the long-leaf pine region, which is the most valuable part of the Southern resource. This comprises a belt of about 125 miles in width along the Atlantic and Gulf coast from North Carolina to Texas, furnishing, together with the rarer Cuban pine, a product which for construction timbers in heavy work has practically only one competitor in the yellow or Douglas fir of the Pacific coast.

The great naval-stores industry, which relies almost entirely upon this pine, and has been carried on to the detriment of the forest and hardly to the profit of the turpentine-gatherer, although representing an annual output of $8,000,000 to $10,000,000, could also only be benefited by being monopolized and made a part of a well-systematized large forest management.

The other two important pines, the short-leaf and loblolly, are no less valuable, their material being useful in other directions of house construction. The short-leaf pine, of very wide distribution, is best developed in Missouri, Arkansas and Texas, and is usually mixed with the loblolly, which also reaches its best development in the latter States. North Carolina has still large areas mainly covered with these two species, which so readily reproduce that to manage them for continuous crops might be considered the easiest task for the coming American silviculturist.

In fact, there is no field, the writer believes, where forest management can be practiced with more satisfaction and with less limitation by present market conditions than these pineries, where easy reproduction and the comparative absence of valueless species in admixture permit to combine concentrated lumbering and natural regeneration.

Of the wealth of broad-leaved hardwoods, of which the South can now boast the largest and most varied supply, the oaks deserve main attention. By the culling process, in which the less valuable species are left in possession of the ground, this most valuable timber has been and is being rapidly eradicated in the composition of the Southern woods. Much more difficulty will be experienced in recuperating these supplies where they have been already mostly taken, as in the Mississippi bottoms and on the lower foothills of the Appalachian mountains. Another species that deserves special attention is the yellow poplar or tulip tree, which in nature's forests occurs only sporadically, and, by the process of culling, threatens soon to be exhausted. It is the one species of the South which furnishes with its soft wood a real substitute for white pine in many directions, and, being a rapid grower, should be specially encouraged in the reproduction of the crop.

In the mixed forest, such as the hardwoods mostly present, the difficulty of satisfactory reproduction lies, first, in the fact that many of the species are not useful, except for fuel, and hence when the valuable species are cut out, only the tree weeds remain to occupy the ground, and reproduce themselves in preference, and secondly, a smaller proportion of their wood goes into logs than with conifers. The amount of debris—rotten, misshapen branch and brush wood—is large. A market for this inferior material, which may be safely estimated as representing in bulk three times the amount of logs, must first be found before a satisfactory management for reproduction is practicable.

Such a market is, unfortunately, not well developed. The consumption of wood for fuel, large as it is, even if it were confined to the use of this inferior material, is, after all, not sufficient to take care of these enormous quantities, and as such cordwood cannot bear the cost of transportation, it requires a nearby population.

In the arts there is, so far, only one extensive use for the better class of cordwood, namely, the wood-alcohol manufacture. But here, too, consumption is only limited, and the cost of manufacture, which in our modern times must be concentrated in expensive factories to make it profitable, forbids the employment of this means of getting rid of the cordwood in many places.

Although the use of wood alcohol has been constantly growing, the manufacture has also kept pace constantly with the consumption, and the business, which can exist only by virtue of the tax on grain alcohol, is constantly in danger of being overdone. With the discovery of the possibility of refining commercially the crude alcohol to absolute freedom from the disagreeable smell—a product which goes under the name of "Columbian spirits"—it is hoped to extend its use greatly for all external purposes. No single one industrial development is of more importance to the forestry interests in the hardwood regions than this or some similar means of making inferior wood material useful.

The writer has dwelt on this phase of the subject especially in order to accentuate the fact that forestry is a business which is in relation to other businesses; that in order to place the forestry business on a proper basis, a market not only for logs, but for other wood material, must be at hand; that while exploitation of forest resources may often be the best policy for an owner working for the present, forest management, i. e., harvesting with a view to reproduction, is the best policy for the community and for large persistent capital.

It is upon the recognition of these principles that the management of a 30,000-acre tract in charge of the New York State College of Forestry has been based, a demonstration which in time will teach its lessons, and may find imitation in many of the hardwood regions of the South.

The Equipment of Alabama

By GOVERNOR W. D. JELKS

I am invited by the Manufacturers' Record to "forecast something of the prospects of Alabama, with a broad generalization of what the future may have in store for the State, and with particular reference to its most striking potentiality."

Last month a long stride was made, in adopting our State constitution, to the future material growth of the State. By a large majority the new constitution, framed in sovereign convention after ninety days' labor in the last summer, was ratified.

Assuming that your inquiry is essentially related to the industrial life of the State, I shall, in a few words, undertake to indicate the reformatory features of the new constitution which directly bear upon the limits of taxation and the application of disbursements of taxes.

Under the constitution now about to be superseded the limit of State taxation was seventy-five cents on the hundred dollars. This limit has been reduced to sixty-five cents on the hundred dollars. The county and town tax cannot exceed fifty cents on the hundred dollars, except in the towns named in the instrument itself, where certain specific taxes are permitted.

The operating expenses of the State government are reduced 50 per cent. by the substitutions of quadrennial for biennial general elections and sessions of the legislature.

It is reasonable to expect a great reduction in interest charges on the State bonded debt of upward of $9,000,000 by reason of the power of refunding delegated to the governor, and which power was wanting under the superseded constitution.

There are limits to county, town or district taxation of a stringent kind. The provision for taxing corporations the same as individuals is plain and specific.

All State-chartered banks, all trust companies and individuals doing a banking business must be examined twice a year by a State examiner. This is a new safeguard.

The provisions for public schools have the effect of giving greater permanency and weight to the institution. The fixed appropriation is increased over the sum that has heretofore been granted or not, at the option of each succeeding legislature. In addition to this augmentation of the strength of the institution, the new constitution provides that each county may tax itself ten cents on the hundred dollars exclusively for the benefit of the public schools in that county. In fact, nearly half of the fixed revenues of the State will go to the public schools under the new constitution.

It is not easy to designate the "most striking potentiality" of Alabama's resources, as your memorandum of inquiry suggests. Our native soil is so blessed that from boundary line to boundary line we have no barren lands, unless an insignificant area on the Gulf coast be so classed. There are approximately 33,000,000 acres within our bounds, and I venture to say there is nowhere a tract of 100 acres, on mountain-top or plain, that is not capable of remunerative soil-tillage. If one acre be described as productive of cotton, the cereals, the grasses, the vine, the orchard tree, the berry, then all acres within the State are described with exact accuracy. We have 6000 or 7000 square miles of coal, iron ore and furnace flux in our central counties, but right along with the mines and the furnaces, in stone's-throw, we have market gardens that produce as large vegetables as any garden in the world. We have in different counties and sections unsurpassed timber of great variety, but the lands from which the timber is removed are first-class agricultural lands. We have a wide belt of black-prairie wooded territory across the center of the State which has a known cotton-producing quality unsurpassed in the cotton States, but the same prairies yield a great variety of cultivated grasses, all the cereals, all orchard crops, many varieties of the grape, and vegetable garden crops most bountifully.

At the recent Pan-American Exposition at Buffalo, N. Y., Alabama won more gold medals for her display there than any State in the Union except New York.

We have some 1500 miles of interior river navigation in Alabama, spreading out, as to most of it, from the single port of Mobile. Let a canal be cut some thirty-eight miles by government survey to connect the Tennessee at Guntersville with the Coosa at Gadsden, costing a possible $5,000,000 to make it ready for boats—this, in view of the removal of obstructions from the Tennessee and Coosa, readily practicable—and we then have unbroken water passage for grain and provisions from Chicago to deep water at Mobile, and we have Chicago in direct cheap connection with the commerce of Central and South America. While the Mississippi river does not actually give water connection of Chicago with the Gulf, the proposed water routes through Alabama from Chicago to Mobile would traverse the greatest and most wealth-bestowing combination of subjects of commerce the world has ever seen available to any given waterway. Agricultural products most profitable to commerce, coal, iron, marble, timber, building stone, the products of mills and of mines and quarries, of art and nature, exist or are expectant along every mile of this route.

I have just remarked on the "potentiality" of Alabama in her amended and reformed and elevated political government. I am left now with space only to give categorical mention of the institutions which we expect to inspire with intensified vigor under new and up-to-date organic law. We are not ashamed of them, even burdened as their growth has been with unpropitious political conditions, forced upon us through a period even longer than the life of one generation. We amended and improved our governmental system by brave and painstaking work, for we believe we are here not to die, but to live.

Alabama justly boasts of its character in permanently established agriculture. If wheat, rye, barley, oats, are profitable in other States for harvest,

they are profitable here in the twofold relation of pasturage in the fall and winter and harvest crop in spring and summer from the same field.

Vineyards are now prosperous in different parts of the State, and tens of thousands of gallons of wine are marketed annually from them. Beyond any doubt, the tomato and other garden products canned for market ripen in this temperate climate, with sunshine, rain and dews to promote perfect health in the plant, with better success than almost anywhere else.

I will not omit the interesting co-incident that in every county in Alabama water may be stored for purposes of farm irrigation in limitless quantities from rivers, creeks, springs and wells. Irrigation is the redeeming art of agriculture.

There are numerous cotton mills in Alabama, confined to no section of the State, and the number increases. The operators are the white men, women and children of the State native to its farms.

There are three recognized coal fields in Alabama, adjacent to each other in the central counties—the Warrior field, 7810 square miles; the Cahaba, 400 square miles, and the Coosa, something in excess of 400 square miles. These are all bituminous coals of every variety and suitable for every use to which bituminous coals are applied. Two of these fields comprise the thickest coal measures in the United States. In between the coal measures are iron ores and furnace flux in deposits so enormous that an estimate of their supply need not be stated here.

The marble fields of Alabama in Bibb, Talladega and Calhoun counties are magnificent, but as yet only touched by commerce. White, red, black, pink marbles susceptible of the highest polish exist in boundless supply in these fields.

Our accomplished State geologist says the marls of Alabama are sufficient to fertilize the farms to the highest degree of productiveness.

We have fine clay, building stone and gold awaiting enterprise.

We believe we pay about $3,500,00 annually on account of pensions drawn and expended in other States, and yet we live.

We daily labor in the production and manufacture of cotton. We mine coal and iron ore, and manufacture iron and steel.

We have sixty-six counties, with well-appointed governments.

We have 4500 miles of trunk railroad, the mileage increasing. We have hundreds of flourishing towns, thousands of postoffices, many scores of vigorous newspapers. We have cities where wealth accumulates, but where men remain alert, progressive and hopeful.

We have an industrial school for (white) girls. We have normal schools for both races, a school for the deaf, dumb and blind, a State university that receives $35,000 annually from the State treasury, and a great polytechnic institution. We have one of the most famous asylums for the insane in all the world.

The port of Mobile does a large and ever-increasing export business in lumber, shingles and naval stores, and an import trade in tropical fruits.

Our saw-mills are busy with the demands of our cities for their products.

Secretary Wilson on the Progress of Agriculture in the South, 1880-1900

By ROBERT M. REESE

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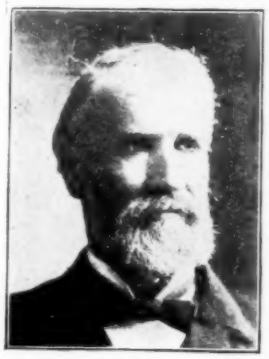
In preparing statistical tables for Secretary Wilson's consideration before this interview was given, "the South" was held to mean the States grouped in the reports of the census of 1890 under the two heads, South Atlantic and South-Central. These groups include the following States: Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, West Virginia, Kentucky and Tennessee. It was desired to make a comparison at three census periods (1880, 1890 and 1900), but the agricultural statistics of the twelfth census are not yet available, and the figures for that year are therefore taken from the reports of the Department of Agriculture. In the case of cotton, all the figures are taken from these reports, where they are conveniently tabulated for many years back. Practically the whole crop of cotton is grown in States included in the above list, and the insignificant amount reported from Kansas, Oklahoma and Utah has, therefore, not been deducted, since it cuts no figure in the immense total.



HON. JAMES WILSON.

ACREAGE, PRODUCTION, VALUE AND FARM PRICES OF COTTON OF THE UNITED STATES, 1879-1899, INCLUSIVE.

Year.	Acreage. Acres.	Average yield per acre. Bales.	Production. Bales.	Average farm price per pound, December 1. Cents.	Value. Dollars.
1879	12,595,500	.46	5,761,252	10.2	242,140,987
1880	15,475,300	.43	6,605,750	9.8	280,266,242
1881	16,710,730	.33	5,456,048	10.0	294,135,547
1882	16,791,557	.41	6,949,756	9.9	309,696,500
1883	16,777,993	.34	5,713,200	9.0	250,594,750
1884	17,439,612	.33	5,706,165	9.2	253,993,385
1885	18,300,865	.36	6,575,691	8.5	269,989,812
1886	18,454,603	.35	6,505,087	8.1	309,381,938
1887	18,641,067	.38	7,046,833	8.5	337,972,453
1888	19,058,591	.36	6,938,290	8.5	354,454,340
1889	20,171,896	.36	7,311,322	8.3	402,951,814
1890	20,809,053	.42	8,652,597	8.6	369,568,858
1891	20,714,937	.44	9,035,379	7.3	326,513,298
1892	18,067,924	.37	6,700,365	8.4	262,252,286
1893	19,525,000	.39	7,549,817	7.0	274,479,637
1894	23,687,950	.42	9,901,251	4.6	287,120,818
1895	20,184,808	.36	7,161,094	7.6	260,338,096
1896	23,273,209	.37	8,532,705	6.6	291,811,564
1897	24,319,584	.45	10,897,857	6.6	319,491,412
1898	24,967,295	.45	11,189,205	5.7	305,467,041
1899	23,403,497	.39	9,142,838	...	334,847,868

"The cotton crop of 1879-80," said the Secretary, "according to this table, was 5,761,252 bales, grown upon 12,595,500 acres. At the high average price then prevailing this crop was worth $242,140,987. During the next decade an enormous increase in the area devoted to cotton-raising occurred, almost 8,000,000 acres more being planted to cotton in 1899-90 than in 1879-80. It seems to have been this vastly increased acreage that made the total value of the crop of 1889-90 so great ($402,951,814), for neither the average production per acre nor the average farm price per pound was as great as in 1879-80. The decade from 1890 to 1900 witnessed nothing like so great an increase in acreage as the preceding decade, only about 4,800,000 additional acres being devoted to this crop in 1898, while in 1899 the acreage was actually less than in the preceding year by 1,500,000 acres.

"It is not impossible—indeed, it is reasonably certain—that with the increase of population, the expansion of our industries and commerce, and the probable great demand for cotton fabrics in our island possessions, very large crops of cotton can be disposed of in future at a profit to the planter. I cannot say that I am desirous of seeing a great increase in acreage, but if by better cultivation a larger average yield per acre can be secured than this table displays, a crop of very large proportions might be cultivated at a cost so much diminished in proportion that the net result to the planter would be a satisfactory profit, even if a great yield did result in lowered prices.

"At present, however, one deduction seems to be well supported by these tables, and that is that the 'bumper' crop is by no means always the greatest blessing to the planter. In 1897-98, for example, the crop of 10,987,857 bales was worth $319,491,412. The next year, when the greatest crop ever grown was picked (11,189,205 bales), the total value fell to $305,467,041, whereas the crop of 1899-1900 (9,142,838 bales), less by more than 2,000,000 bales than the crop of 1898-99, was worth $334,847,868, or more than $29,000,000 more!

"In this connection mention must be made of the phenomenal advance made by the State of Texas since 1879 in the production of cotton. In that year the total area devoted to cotton in Texas was 2,178,435 acres, with a total production of 805,284 bales. In 1889 the total area from which cotton was gathered in this State was 3,934,525 acres, with a production of 1,471,242 bales, an increase of 92.38 per cent., or almost double. The great crop of 1898-99 yielded in Texas 3,363,109 bales on an acreage of 6,991,904 acres, or considerably more than double. In 1899-1900 Texas, like the rest of the cotton States, fell off in production, her yield being less by 900,000 bales than in the preceding year.

"The average yield per acre of cotton, as shown by the subjoined table, is, in my judgment, much too low. Having had no experience with this crop, however, I am possibly not sufficiently appreciative of the difficulties involved in raising it, but that it should take from two and one-half to three acres to produce one bale of cotton certainly seems to indicate defects somewhere in the culture of this staple:

AVERAGE YIELD PER ACRE OF COTTON IN THE UNITED STATES, 1891-1900, BY STATES.

States and Territories.	1890-91. Bales.	1891-92. Bales.	1892-93. Bales.	1893-94. Bales.	1894-95. Bales.	1895-96. Bales.	1896-97. Bales.	1897-98. Bales.	1898-99. Bales.	1899-1900 Bales.
Virginia	....	....	....	....	0.21	0.18	0.24	0.25	0.27	0.23
North Carolina	....	....	....	0.34	.35	.38	.42	.50	.48	.41
South Carolina	....	....	....	.34	.38	.42	.46	.50	.44	.38
Georgia	....	....	....	.33	.33	.35	.37	.38	.39	.41
Florida	....	....	....	.33	.24	.20	.18	.21	.23	.28
Alabama	....	....	....	.35	.32	.28	.31	.41	.39	.35
Mississippi	....	....	....	.37	.41	.41	.42	.55	.43	.43
Louisiana	....	....	....	.50	.55	.45	.46	.63	.56	.59
Texas	....	....	....	.48	.45	.33	.31	.39	.48	.37
Arkansas	....	....	....	.36	.48	.44	.39	.58	.49	.39
Tennessee	....	....	....	.34	.33	.24	.26	.28	.36	.26
Missouri	....	....	....	....	.38	.25	.31	.32	.40	.42
Oklahoma	....	....	....	....	.45	.54	.45	.51	.50	.32
Indian Territory	....	....	....	....	.45	.32	.62	.65	.66	.40
General average	.416	.436	.371	.387	.418	.355	.367	.448	.448	.391

"There is so intimate a relation between the agriculture of the South and the cottonseed industry," continued the Secretary, "that some discussion of this by-product is pertinent in this place. In connection with the crop of 1899-1900 there were produced about 4,500,000 tons of cottonseed. Probably 3,000,000 tons of this would be available for working up into cottonseed products after retaining enough to seed for the next crop. Were the oil expressed from the whole 3,000,000 tons there would remain, say, 1,200,000 tons of meal (a most valuable feeding stuff and fertilizer), with an equal amount of coarse fodder in the shape of hulls. A ton of cottonseed will yield,

under the best processes, about forty gallons of oil, worth, say, $10. This makes the value of the crop of oil alone $30,000,000. The meal (1,200,000 tons) at $20 per ton would be worth $24,000,000 more; the hulls (1,200,000 tons at least) at $3 a ton would be worth $3,600,000, and the linters, if saved, might be worth $1,500,000 more. It is, then, a conservative estimate that puts the value of the crop of cottonseed for 1899-1900 (if it were all utilized) at $59,000,000.

"The following table, showing the Treasury Department's statistics of the exports of cottonseed oil for the year 1880 and all the years since 1890, shows in a striking way the growth in this industry during the period we are considering:

EXPORTS OF COTTONSEED OIL.

Years ended June 30—	Quantities. Gallons.	Value. Dollars.
1880	6,997,796	3,225,414
1890	13,384,385	5,291,178
1891	11,003,160	3,975,305
1892	13,859,278	4,982,285
1893	9,462,974	3,927,556
1894	14,958,360	6,008,405
1895	21,187,728	6,813,313
1896	19,445,848	5,476,510
1897	27,198,882	6,897,361
1898	40,239,784	10,137,619
1899	50,627,219	12,071,519
1900	46,902,390	14,127,538

"The exports of cottonseed oilcake and oilcake meal were not separately reported by the Treasury Department until 1895. Since that date the figures are as follows:

EXPORTS OF COTTONSEED OILCAKE AND OILCAKE MEAL.

Years ended June 30—	Quantities. Pounds.	Value. Dollars.
1895	489,716,053	4,310,128
1896	404,937,291	3,740,232
1897	623,386,638	5,515,800
1898	919,727,701	8,040,710
1899	1,079,993,479	9,253,398
1900	1,143,704,342	11,229,188

"Thus in the fiscal year ended June 30, 1900, considerably more than $25,000,000 was realized from the export of these cottonseed products, which in 1880 probably did not exceed, if they equalled, $5,000,000 in value. This is beyond doubt one of the most remarkable cases on record of the rescue and conversion into wealth of what was formerly almost a waste and nearly always a troublesome product of the cotton plantation. All this enormous value has been created from that of which thousands of tons were formerly burned or thrown into the rivers.

"I am not at all sure, however, that the heavy export of cottonseed oilcake and oilcake meal is the best disposition the South could make of this wealth. A much larger proportion of it should be returned to the soil than is now utilized in that way, to the permanent improvement of Southern agriculture.

"The lint of cotton is comparatively poor in fertilizing constituents, and if the lint alone were removed from the soil, cotton would be one of the least exhausting of crops. But cottonseed meal is very rich in nitrogenous elements, and as it is always the paramount duty of the farmer to maintain the fertility of his farm, the valuable fertilizing constituents of the cottonseed should be returned, as far as possible, to the soil. The best way to do this is not, in my judgment, to use the meal or cottonseed directly upon the ground. There is a far more philosophical and profitable way to use this material, and that is by feeding it to domestic animals. Everything that can be fed to domestic animals should be returned to the soil through that agency. All the cattle (over 400,000 in number) that the United States exported last year could have been finished off on this by-product of the cotton plant. The South certainly has prior claims on this invaluable cattle food, and should sell it not in the form of material to fatten other men's steers, but in the shape of beef for its own profit. Add skill to the plant food of the farm, and sell a finished product, instead of selling a raw material for other people to employ their skill upon, and thereby pocket a gratifying profit."

"These considerations, Mr. Secretary," said the interviewer, "bring one naturally to the consideration of live-stock in the South. I regret that no statistics of the present numbers of live-stock are available, the returns of the present census being as yet incomplete, while the statistician of the Department is awaiting the census reports in order to revise his figures, as is customary every ten years. What can you say upon this head?"

"Only this," replied the Secretary, "that from my own observation and the reports I get from persons who have traveled through the South lately, the live-stock industry in that section is making a satisfactory advance. I believe that the natural multiplication of flocks and herds has had no serious checks, and, what is better, that the quality of the stock that is kept is gradually improving. Certain it is that with the incomparable advantages possessed by the South for engaging in the live-stock industry, it should be in a highly prosperous condition. With a climate favorable to the easy sheltering of cattle, and with a 'finishing' feed of such excellent qualities as cottonseed meal, the South seems to lack but one thing to become a great cattle country, and that one thing is more grass. The appended table shows that although the production of hay has somewhat fallen off in the last decade, the average yield per acre has increased and is relatively high as compared with the average for the United States:

ACREAGE, PRODUCTION AND AVERAGE YIELD PER ACRE OF HAY IN THE SOUTHERN STATES.

Year.	Acreage.	Production. Tons.	Average yield per acre. Tons.
1880	1,761,853	1,466,355	.82
1890	3,808,552	4,260,728	1.17
1900	2,764,494	3,774,494	1.36

In the United States for the year 1900 the acreage in hay was 39,132,890, the total production 50,110,906 tons, and the average production per acre 1.28 tons. The figures for 1880 and 1890 are from the census reports; those for 1900 from the reports of the Department of Agriculture, division of statistics.

"The Department of Agriculture has been making rather a special effort to encourage the growth of grasses and forage plants in the South, and has published a number of farmers' bulletins on the subject. Bermuda grass for pastures, alfalfa for forage, sorghum for soiling, and cowpeas for the double purpose of supplying forage and renovating the soil, will help to make of the South the great cattle country it should be. More than once of late I have called attention to the condition of the ranges of the West, and have expressed the opinion that the beef cattle of the future (and the near future at that) must come from the farms of the country. Here lies one of the South's great opportunities. Dairying and the production of beef cattle, the breeding of fine horses (an industry to which Southerners take naturally) and the production of early-spring lambs for Northern markets will, I am sure, bring enormously increased wealth to the South in a very few years.

"And this wealth will consist not alone in the money returns for the animals and animal products sold, but in the vastly increased fertility of the soil. In a recent address I ventured the opinion that future prosperity on the farm hinges upon the animal that eats grass and legumes, hay and grain, and carries *skill* to market. But the animal that carries skill to market leaves fertility behind it if it has been fed upon the farm, upon the farm's produce. The cultivation of cowpeas and other leguminous crops has an immediate effect in fertilizing the soil and preparing it for other crops. When that part of the crop which is above the soil has been consumed by animals, the part below the soil is of immense value in loosening the subsoil and furnishing the indispensable humus that has been so largely burned out of Southern soils by continuous cotton-raising.

"There are between 300 and 400 species of native grasses found growing in the South. With a climate so favorable to the growth of grass that by a proper succession pasture may be secured during the whole year; with an annual precipitation over most of the South of over fifty inches; with cottonseed meal to enable the use of a balanced ration, and with a great quantity of land well adapted to grazing development, there seems to be no reason why the statistics of the cattle industry of the South at the taking of the next census should not show a truly marvelous advance. The investigations of the Department of Agriculture justify the hope that we shall find many species of grasses and forage plants that may be adapted to the conditions of all parts of the South. In particular, we hope to discover some practicable way of raising Bermuda grass from the seed, instead of the present expensive and troublesome method of propagating it from the roots.

"The two following tables, giving the acreage, production and average yield per acre of wheat and corn in the South for 1880, 1890 and 1900, show that in comparison with the great cereal States of the West and Northwest the South is not a grain-growing section. The average yield per acre of corn has ranged between fifteen and eighteen bushels per acre for the Southern States, while the general average yield for the whole country has ranged from a little over nineteen to a little over twenty-seven bushels per acre:

CORN.

Year.	Acreage.	Production. Bushels.	Average yield per acre. Bushels.
1880	23,771,395	374,786,155	15.7
1890	24,787,787	446,157,025	17.9
1900	30,423,972	481,666,120	15.8

"In wheat the showing is apparently a little better, the improvement, however, being due to the relatively high average yield in the States of Delaware, Maryland, Virginia, Texas and Kentucky. In all the other States included in this consideration the general average for ten years has run much below the general average for the whole country:

WHEAT.

Year.	Acreage.	Production. Bushels.	Average yield per acre. Bushels.
1880	6,689,181	52,812,866	7.5
1890	4,983,535	51,937,960	10.2
1900	7,284,614	94,837,975	13.01

"It has been claimed by some that this low average yield of grain is due to the climatic conditions of the South, the more equable climate and the heavier rainfall tending to the production of vegetation rather than grains and seeds. The theory is ingenious, but the variety of soil and climate in the South is so great that generalizations of this kind are subject to many exceptions. Isolated instances of very large yields of corn, at least, show that with adequate cultivation a much higher general average yield may be attained in the South than has heretofore been the rule. The largest yield of corn on record (said to be 237 bushels per acre) was grown in South Carolina, and I have not the least doubt that with proper attention and skill the average yield per acre of corn in the Southern States may be greatly increased.

"Extremely significant in the agricultural advance of the South are the available statistics of the rice industry. In 1879 the rice crop of the United States, as reported by the census of 1880, was 110,131,373 pounds, grown upon 174,173 acres, an average production of 632 pounds per acre. By 1889 the crop had increased to 128,590,934 pounds, grown upon 161,312 acres, an average of 797 pounds per acre (census of 1890). Here again it is unfortunate that the figures of the twelfth census are not yet available, but the subjoined table, furnished by Dan Talmage's Sons, New York, is probably a careful and conservative estimate:

PRODUCTION OF RICE IN THE UNITED STATES, AND IMPORTS.

Years.	Marketed production, year ended August 30. Pounds.	Imports, year ended June 30. Pounds.	Total production and imports. Pounds.
1891	126,800,000	133,104,063	259,904,063
1892	155,665,800	85,112,164	240,777,964
1893	237,546,900	81,031,944	318,578,844
1894	122,865,160	86,810,536	209,675,696
1895	109,820,800	141,301,411	251,122,211
1896	168,685,440	78,190,334	246,875,774
1897	96,886,400	133,939,930	230,826,330
1898	116,301,760	129,810,630	246,112,390
1899	126,990,720	153,837,026	280,827,746
1900	219,278,200	93,648,451	312,926,651

"The exports of domestic rice from the United States have always been insignificant until the fiscal year ended June 30, 1900, when they made a great advance, forming 40 per cent. of the export trade. The remainder of the exports was foreign rice re-exported. The following table shows the sudden jump in the exports of domestic rice in 1900 over the previous ten years:

EXPORTS OF RICE FROM THE UNITED STATES.

Year ended June 30—	Domestic. Pounds.	Foreign. Pounds.	Total exports. Pounds.
1891	540,630	8,119,574	8,660,194
1892	.....	10,577,423	10,577,423
1893	756,992	10,811,072	11,568,064
1894	783,425	11,877,253	12,660,678
1895	124,208	10,271,357	10,395,653
1896	1,316,576	13,649,466	14,966,342
1897	387,288	11,607,634	11,994,922
1898	637,146	10,305,694	10,942,840
1899	852,704	19,114,698	19,967,402
1900	12,947,009	18,267,687	31,214,696

"The total of production and imports for any given year, *minus* the total exports for that year, will represent the quantity of rice available for consumption in the United States. The excess of the production and imports of rice in the United States over the exports for ten years past is shown in the subjoined table:

	Pounds.		Pounds.
1891	261,243,869	1896	231,909,432
1892	230,200,541	1897	218,831,408
1893	307,010,780	1898	235,169,550
1894	197,035,018	1899	270,860,344
1895	240,726,558	1900	281,711,955

"The consumption of rice in the United States in the fiscal year ended June 30, 1900, ran something above 275,000,000 pounds, and as the production in the same year was about 220,000,000 pounds, it appears that the United States was within 55,000,000 pounds of supplying the home demand for rice in that year. It is a very safe guess that very soon this country will be producing every pound of rice it needs for home consumption, and have a large and increasing surplus for export. The Department of Agriculture is far from claiming entire credit for this great and rapid advance in the rice industry, yet I may venture to call attention to the good results that have followed the introduction, three years ago, of improved varieties of Japanese rice into Louisiana and Texas, whereby the growing of rice in those States received an impetus that led to the investment of something like $20,000,000. The condition of this particular industry of the South should be eminently satisfactory to all interested.

"The United States imports from $10,000,000 to $12,000,000 worth of tea every year. Of course, it will be a long while before we produce that amount of tea within our own borders, but, beyond question, there are thousands of acres of land, and, I may add, thousands of idle hands, in the South that might be profitably employed in this work. The profit in the crop averages from $30 to $40 per acre net. It was shown long ago that the tea plant thrives well enough in many parts of the South, but the problem of cheap labor seemed to be unsolvable. The well-known and successful experiments of Dr. Charles U. Shepard at Summerville, S. C., have, however, pointed the way to utilization as tea-pickers of the colored boys and girls, now almost absolutely unproductive units in the population of the South. Dr. Shepard in the year just ending has produced and found a ready market for some 4500 pounds of tea, graded by New York experts as of the very best quality. I am convinced that in fostering the experiments of Dr. Shepard the government has been aiding one of the most significant beginnings that have ever been made in the agriculture of the South.

"Want of space, as well as the lack of any official statistics, prevent the consideration here of other thriving agricultural industries of the South, as, for example, the great trucking business, but it is apparent that Southern agriculture has made a healthy growth during the period we are considering. One of the most hopeful features of this progress, to my mind, is the tendency to a wider diversification of crops. I believe that the South will not much longer be known and thought of primarily as 'the land o' cotton,' but as a great and prosperous region of varied agricultural industries. With the great industrial progress of the Southern States and the development of their wonderful mineral and manufacturing resources comes the best of all markets for the farmer—the great home market. More and more I hope to see the agriculture of the South diversified as this great home market expands. Let the cotton crop continue to increase in total production, but let its growth be rather by a higher average per acre than by a very large extension of the area under this crop. Let Southern farmers keep the plant food at home and send the products of the farm to market in the form of manufactured articles (manufactured on the farm by nature's processes) rather than in the form of raw material. Let them grade up their flocks and herds and keep many more of all kinds of domestic animals. Let them renovate the soil by the use of legumes, and save all the fertilizing material that the farm itself produces. Then will the agriculture of the South show in the census to be taken in 1910 advances greater by far than even the great progress made in the last twenty years of her history."

R. M. Reese

Virginia Agriculture and Manufactures

By EX-GOVERNOR J. HOGE TYLER

Virginia, probably more than any other Southern State, is identified with manufacturing interests as well as those of agriculture. The South is, strictly speaking, an agricultural section, but in the last quarter of a century she has made rapid strides in the advancement and promotion of manufacturing enterprises. The Old Dominion as a center for the industrial arts has advantages peculiarly her own. Chief among these is her location, which places her in close touch with the greatest market of this country. Richmond, her capital city, is only eight hours by rail from New York, while vessels from Norfolk make the trip to the nation's metropolis in twenty-four hours. From Norfolk vessels sail to every part of the civilized world.

No State in the South is better supplied with water-power than Virginia. The James river alone would drive the wheels of manufacturing plants upon 300 miles of its course, while the streams tributary to it would furnish the power for factories and mills almost without number, and the water-power facilities of o her rivers—the Appomattox, Roanoke, New and Clinch—are almost unlimited.

Virginia offers inducements for manufacturing industries that are surpassed by but few States in the Union. She has the raw materials at her hand and the power to convert them into the manufactured product. There are vast forests of timber in which the woodsman's axe has never sounded. In the bowels of the earth are rich deposits of copper, iron, zinc, lead, and even gold. The pits of her coal fields seem inexhaustible, and from her quarries are taken the finest building stones, including granite.

The manufacture of tobacco is one of the most important industries of the State. The tobacco factories at Richmond, Lynchburg, Petersburg, Danville and Farmville furnish no small part of the world's supply of the fragrant weed in its manufactured form. Thousands of men, women and half-grown girls and boys are employed in these factories.

Virginia is not one of the cotton States, though the product is grown to some extent in the southside counties, but the Old Dominion has within her borders many cotton mills, among these being one of the largest in the country. In this mill, which is located at Danville, 68,000 spindles are operated.

Richmond, with a population, including its suburbs, of 120,000, is naturally the manufacturing center of the State. Here are employed in manufacturing enterprises more men, women and children, in proportion to its size, than any other place in the United States, save one. There are five plants in Richmond that rank among the greatest in the world, while those of less importance than these giant concerns are too numerous to mention. The Richmond Locomotive Works constructs the largest locomotives in the world, and the output of these shops averages one of these mighty machines a day. The works employ about 1800 men. Last year 165 of the largest-sized locomotives were built here, and in July twenty "iron horses," each weighing 187,000 pounds, exclusive of tender, were constructed.

The Trigg Shipbuilding Co. is one of the new industries of Richmond. One thousand men are employed at the yards of the company. Several torpedo-boats have been built here for the United States government.

The largest wood works in the world are located in Virginia's capital, they being the Richmond Cedar Works, the product of which is exported to England, France, Germany, South Africa and Australia. Twelve hundred hands are employed at these works.

The Tredagar Works furnishes steel horseshoes to the British army, while the Old Dominion Iron and Nail Works ships its product throughout the length and breadth of this country.

The most gigantic of all Virginia's enterprises, however, is the Newport News Shipbuilding Co. This plant, which is the best equipped in the United States and among the finest in the world, employs 8000 men. Four great battleships of the United States have been built here—the Texas, the Illinois, the Kentucky and the Kearsarge. At the present time these shipyards are employed in building the two largest steamships ever constructed in America.

Petersburg is a manufacturing city of considerable importance. It claims to have the largest trunk factory in the world, while there are also three other similar plants of smaller size in that city. A large silk factory is also one of the principal enterprises of Petersburg. In the city of Lynchburg 5000 men are employed in her various mills and factories, the total output of which is estimated at $9,000,000 per annum. Roanoke, a railroad center of importance, and known as the Magic City, because of its rapid growth, has extensive manufacturing enterprises, among which are its great car and engine works.

However, it is not alone at the large cities that industrial enterprises flourish. Nearly every town in the State is identified with some manufacturing plant. In Fredericksburg, which is just half-way between Richmond and Washington, there is a silk factory, and also a woolen mill, flouring mill and a large shoe factory. Charlottesville has a woolen factory that weaves the very finest of cloth, which has been awarded premiums at every competitive test.

It is a fact not generally known even to Virginians that in the historic town of Winchester is located one of the most successful glove factories in the United States. So great has been the success of this factory that two others have been established in the town. Winchester, however, has enterprises other than her three glove factories. She has a knitting factory, a paper mill, a flour mill with an output of 300 barrels per day, a sumac mill, and a sash, door and blind factory. Staunton, the largest town in the famous Valley of Virginia, has its flourishing mills with a capacity of 600 barrels per day, an iron foundry and machine shops, extensive wagon works, and what is probably not known to many of our own people, an organ factory, from which instruments are shipped to all parts of this country, as well as to Europe.

Radford, one of the towns of Southwest Virginia, has a large pipe and foundry works. To enumerate the many important manufacturing enterprises of the State, however, would be almost an endless task, and quite beyond the scope of this article. I have merely attempted to give some idea of the variety of industries in Virginia and the magnitude of some of them.

The Old Dominion is fully alive to the spirit of the age, and her vast resources are now being developed as they never were before.

In conclusion, to give evidence of the material progress and advancement made by the State, I would call attention to data furnished in two splendid addresses delivered at my request at the Pan-American Exposition—one, by Mr. Joseph Bryan of Richmond, on the subject, "Physical Features and Natural Resources of Virginia," and the other, by Prof. Geo. W. Miles of Radford, on "Educational Life in Virginia."

J. Hoge Tyler

Influence of Industrial Expansion in the South

By THEODORE C. SEARCH

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President National Association of Manufacturers

Progression from agriculture to manufacture has been attended in every section of the country by certain elements of advantage which are so self-evident as to require no proof. They are so plainly to be seen that they are likely to be unnoticed unless attention be called to them. It matters not what part of the country be taken for a study of these changing conditions, for the phenomena are practically the same wherever found. The transition from the farm to the factory has brought much the same results in New England, in Pennsylvania, in the Middle West and in the South. As the section in which this change is now progressing in marked degree, and as the portion of the country in which material progress has been made under most adverse conditions during the quarter-century last passed, the South affords an interesting field in which, just now, to study the influence of expanding manufacturing interests.

THEODORE C. SEARCH.

In the oldest industrial sections of the United States manufacturing has grown at the expense of agriculture. Particularly is this true of New England, where hundreds of abandoned farms furnish convincing evidence of the more potent attractions which the busy industrial centers have held out to those who found it hard to win a living from rugged soil. In New York, Pennsylvania and the Central West a more productive soil has resisted more stubbornly the allurements of the manufacturing communities, but even in so rich an agricultural State as Pennsylvania hundreds of richly productive farms are begging for buyers, because their owners and their workers have been drawn townwards by the demands of the great manufacturing enterprises.

It has been conspicuous in the industrial development of the South, however, that manufacturing has not encroached upon agriculture, and the increasing population of the factory towns and cities has not grown at the expense of the farming communities. This has been due to the existence in the South of an abundance of labor, more than was profitably employed in agriculture, as well as a very large element unused to regular application to any kind of productive occupation. A careful study of the principal industries of the South will show that by far the larger part of the operatives has been drawn not from the fields, but from virtual idleness, or at least from a life in which labor was neither continuous nor profitably productive.

To be more specific, the simplest labor in Southern industries today is performed by men, white as well as black, for whose strong arms no demand existed continuously before their present occupations were opened to them. An overabundant negro population, exceeding even the needs of a vast specialized agriculture, has readily spared many thousands of men for the coal mines and coke ovens, the iron-ore mines, the phosphate beds, the quarries, the blast furnaces and rolling mills, the saw-mills and cotton-oil plants, and farming has suffered not a whit from this diversion of labor.

The cotton mills have drawn their help by the hundreds of thousands mainly from the up-country, from the remote interior regions where no industry other than the simple needs of each household offered inducements to labor. Even a primitive agriculture made small demands upon the energy of these people.

Far from working any injury to agriculture, the increase of manufacturing interests in the South has been in every way beneficial to all phases of industry dependent upon the culture of the soil. Without reducing to any appreciable extent the supply of labor required for farming operations, the industrial growth of the South has stimulated the diversification of agriculture, and has very greatly enlarged the home markets for a wider range of products of the farm and garden. The withdrawal of a very considerable population from farming for mere self-support of most primitive nature, and the migration of all these people to the factory towns and small mill villages, has transferred their support to those who farm for profit or follow market-gardening as a business.

Any large manufacturing center in the South will illustrate how largely the building of mills has thrown upon the surrounding country the support of a large population which has no time to raise garden truck, but has money with which to buy more abundantly than ever was known before the coming of the mills.

Perhaps the greatest benefit that has been bestowed upon the South by the growth of manufacturing is the giving of continuous and profitable employment to a vast number of people who never before knew what steady work and good wages meant. Particularly is this true of the cotton-manufacturing industry of the Piedmont region and further in the Southeast. For the most part, the operatives employed in the cotton mills have been drawn from the mountain regions, and the benefit that has been bestowed upon this class of people can be appreciated only when opportunity is given for personal study of their condition, past and present.

The cotton mill has made of these backwoods folks industrious and prosperous citizens. Families that were reared in rude huts, under most primitive conditions, rarely seeing any actual money, and lacking nearly all that makes up modern civilization, now occupy comfortable homes in the mill villages, live in comfort, have money in bank, and constitute a desirable class of industrious mill help. Without the advent of manufacturing industries this great resource of the South would have remained undeveloped and practically unknown.

Industrial development everywhere tends to concentrate population in the cities. Each succeeding decennial census sees a larger percentage of the total population of the country gathered in the cities. There is no diminution of population in the country, but the increase is more rapid in the cities. Each center where people are gathered seems to exercise a continually increasing power of attraction, and the growth of cities seems to progress more and more rapidly. It is customary among students of social conditions to regret this tendency and to see only evil in the concentration of population in the cities, great and small. True, there are conditions in urban life that are to be deplored, but, on the other hand, the growth of cities, towns and villages has been of inestimable value to the people themselves, both individually and collectively.

The drawing of people together in manufacturing communities in the South has been of incalculable value, not alone to the individual citizens, but as well to the South as a whole. The people who have thus been brought together enjoy advantages for self-improvement which never before were within their reach. The sparse and scattered population of purely agricultural regions cannot support schools in such number and of such excellence as are easily possible in every town and city. The same is true of churches. In the more active life of the industrial centers there is a continuous development of energy and ability for which there is neither inspiration nor opportunity in the seclusion of farm or forest. It is hardly saying too much to assert that the discipline and inspiration of industrial life are doing more in a single generation to bring out the abilities of the people themselves than any other influences have done through many generations of Southern life.

This result is manifest, from the executive heads to the lowest laborers in the manufacturing industries of the South. One of the most interesting features that is disclosed by a study of the personnel of the factories of the South is the surprisingly large proportion of Southern-born and Southern-bred men who fill the responsible positions and bear the real burden of the business. And for the most part these are men who have had neither ancestral influence nor early training calculated to fit them for such position. In most cases their fitness has been discovered only when necessity has forced them to apply themselves to industrial pursuits. There is no greater tribute to the energy and ability of Southern men than the record of their conspicuous successes in industrial enterprises for which they were never trained or educated.

Developing manufactures have thus discovered in a people generally regarded as agricultural by nature, inclination and training many men of marked ability in industrial occupations requiring business acumen, mechanical genius and executive faculty. There are many such men who have not only left their impress on the South, but also have made themselves felt in the larger industrial life of the nation.

Industrial expansion is freeing the South from exclusive dependence upon agriculture, and thus is greatly increasing the material prosperity and stability of that part of the country. No region that depends wholly upon agriculture ever is sure of continuous prosperity. There are years when the farmers are phenomenally prosperous, as witness the past year in Kansas and some other Western States, but the vicissitudes of agriculture are such as constantly to menace the prosperity of the farmers, particularly when they raise only the great staples for the world's markets.

The South has its periods of plenty and adversity as the cotton crop fluctuates, but the constantly increasing importance of the mining and manufacturing industries tends to preserve the equilibrium of business. This is effected in two ways—by diversifying agriculture to meet the requirements of a growing mill population, and by the continuous circulation of a vast amount of capital employed by the manufacturing industries in the employment of labor and the purchase of material.

The manufacturing industries of the South depend wholly upon native materials. Practically nothing they use is imported, or even brought from other parts of the United States. Iron ore, coal, cotton and lumber are the great foundations of the manufacturing interests of the South, and the development of these resources means the creation of new wealth, not the expenditure of capital for the purchase of materials elsewhere to be worked up in the South.

This is peculiarly a Southern condition. New England, the oldest, busiest and most advanced manufacturing section of the country, produces but little of the materials consumed in her industries, but must go to Pennsylvania for iron and coal, and to the South for cotton and for much of the lumber that is required.

The South, therefore, enjoys a peculiar advantage in finding at home all the materials for her industries, and it is self-evident that the utilization of these vast resources at home is immeasurably more advantageous than the sale of the materials to manufacturers in other sections of the country. It is very clear that the circulation within the South of the several hundred millions of dollars in continual use by the manufacturing industries adds more than can be estimated to the general prosperity of that section and to the stability of its well-being.

The influence of the industrial development of the South is manifest in every branch of business and in every walk of life. It is evident in the improvement and increased prosperity of the railroads, to which the manufacturing interests supply an enormous volume of traffic. The same influence shows itself in banking and in mercantile business, and even coastwise commerce derives very material benefit from this continuous expansion of industry.

To sum it all up, my analysis of Southern conditions demonstrates to my entire satisfaction that the increased and ever-growing prosperity of the South and the betterment that is manifest in every phase of life is due to the growth of manufacturing more than to any other cause.

Theo. C. Search

Phases of Southern Railroad Development, 1881-1901

By JOHN P. MEANY

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Editor Poor's Manual of Railroads

Although the State of Maryland is not included in any of the accepted geographical divisions of the country, its omission from consideration in any general review of Southern railway development would render such review incomplete in many respects.

JOHN P. MEANY.

In 1828 the attempt was first made in this country to construct a railroad adapted alike to the transportation of passengers and freight. The Erie canal had cut off the trade which Philadelphia and Baltimore had hitherto received from the West, and as the project of a canal from the city of Baltimore to the Ohio was regarded by many as impracticable, the merchants of that city, in 1827, procured the charter of the Baltimore & Ohio Railroad. On July 4, 1828, its construction was begun, the first act being performed by the venerable Charles Carroll of Carrollton, the only surviving signer of the Declaration of Independence. At the close of the ceremony of breaking ground Mr. Carroll said: "I consider this among the most important acts of my life, second only to that of signing the Declaration of Independence, if even second to that." In the fall of 1829 the laying of the rails within the city of Baltimore was begun. On May 22, 1830, the first section of fifteen miles, to Ellicott's Mills, was opened. Like all others constructed at the time, it was an unsubstantial structure, with longitudinal sills, on which was placed a thin bar or strap of iron. Although locomotive engines had obtained some use in England and two or three had been imported into the United States, this road continued for nearly a year after its opening to be operated by horse-power. An ingenious but unsuccessful attempt was made to propel the trains by the use of sails. As some more efficient power than that of horses seemed indispensable, the company, on January 4, 1831, invited proposals for the construction of a steam engine for its use, "which, when in operation, must not exceed three and one-half tons in weight, and must, on a level road, be capable of drawing, day by day, fifteen tons, inclusive of the weight of the wagons, fifteen miles per hour." In response, three engines were offered to the company. One only, constructed by Phineas Davis of York, Pa., was accepted as coming up to the required specifications. Although this engine was incapable of surmounting any considerable grades, it served to assure the officers of the company of the practicability of working their railroad by steam-power. In the annual report of the company for 1831, its president, Philip E. Thomas, stated that, "by many improvements made in the application of working-power, an immense reduction in the cost of transportation and an increase of velocity had been effected. Among the most valuable of these improvements is the combined cylindrical and conical car wheels, invented by the chief engineer of the company, Mr. Jonathan Knight, which have been found of the utmost importance by the facility they afford of turning curves. By the aid of this highly valuable improvement every doubt is removed of our ability to employ locomotive engines upon the Baltimore & Ohio Railroad. This discovery is the more important to us inasmuch as from the surface of the country over which our route must be constructed numerous curves in the tracks will be unavoidable; and the great advantage in this form of wheel consists in their so readily accommodating themselves to the degrees of curvature upon the road that there scarcely appears to be any perceptible obstacle to the passage of cars over them greater than on a straight line."

The next important one was the South Carolina, begun in 1830 and opened for traffic in 1833 for its whole length (135 miles). At that time it was the longest continuous line of railroad in the world.

Th charter of the South Carolina Railroad was granted on December 19, 1827, and authorized the corporation, under the name of "South Carolina Canal & Railroad Co.," to establish railroad communication between Charleston and the Savannah river at or near Hamburg, or any other points on the same river judged necessary, with the right to build branches at any time from the main stem to Camden or Augusta, with the option to construct independent lines from these places to Charleston. The capital stock authorized was 7000 shares of $100 each, and the company was empowered to organize when 3500 shares should be subscribed and 10 per cent. paid in thereon. The exclusive use of the routes, with exemption from taxation on the capital stock and real estate for thirty-six years, was granted, no restrictions or limits being imposed as to the period of the company's existence or the rate of dividends it might pay. Transportation charges were not to exceed five cents per mile for passengers and thirty-five cents per 100 pounds for every 100 miles on heavy freight. The board of directors, including the president, was to consist of thirteen persons, on whom were conferred the usual privileges of locating and operating the road, imposing tolls, declaring dividends, etc. They were, however, made personally responsible for any pecuniary obligations that might be incurred and not paid beyond the amount of capital stock subscribed. Trespass on the line was made a misdemeanor punishable by not less than one month's imprisonment. The work was required to be begun in two years and finished within six years from the date of the charter.

The first step after obtaining the charter was taken in February, 1828, when the Charleston Chamber of Commerce appointed a committee to investigate and report on the effects of railways upon the trade and general interests of the city. Early in March, 1828, Major Black of the committee presented a very able report on the subject, which was followed by preliminary surveys of the route as far as Hamburg. The results being considered satisfactory, subscription-books were opened on March 15 in Charleston, Columbia, Camden and Hamburg. The charter made the subscription of 3500 shares within six days necessary, and this was accomplished by the citizens of Charleston alone. On May 12, 1828, the company was organized, William Aiken being chosen its first president.

The earliest estimates fixed the cost of the road, with a small equipment, at from $405,000 to $595,000. The rail contemplated was to weigh from fifteen to seventeen tons per mile, and was to be laid, for the most part, on *pile* foundation. The final surveys and location of the road were completed under the supervision of Horatio Allen, who acted as chief engineer of the road for some years afterwards. In December, 1830, the first contract was let for the construction of four miles. The contracts for the rest of the eastern division to Branchville were let during the following years. Thirty miles of the western division were put under contract in March, 1831, and all except three and one-half miles of the remainder in the following June.

The eastern division—sixty-two miles—was opened for traffic on November 7, 1832. In February, 1833, it was opened to Medway—seventy-two miles—and in October, 1833, the entire line to Hamburg was completed.

This was the first railroad of more than 100 miles in length constructed in the United States. It was the first railroad on which the United States mail was carried. The first American-built locomotive, the "Best Friend," was run upon it. The first trials of this famous engine took place on December 9 and 13, 1830. On the last day's trial an average run of fourteen miles an hour was made. Later, with forty to fifty passengers, the "Best Friend" made a run averaging sixteen miles an hour, and made on a straight line from seventeen to twenty-one miles an hour. In those early days this was considered a very fast run. The "Best Friend" came to an untimely end in the summer of 1831 by being exploded, a negro fireman having stopped the safety-valve. The engine was afterward rebuilt at Charleston, but the name of it was changed to "The Phoenix."

It was on the South Carolina Railroad that eight-wheel passenger and freight cars were first introduced. That was in July, 1837, and the idea, like so many other brilliant ones affecting the construction and operation of our railroads, originated with Horatio Allen.

Encouraged by the construction and successful operation of the Charleston & Hamburg road, as the South Carolina Railroad was popularly called, certain enterprising persons conceived the idea of opening an avenue through to the Ohio river. In pursuance of this idea the Louisville, Cincinnati & Charleston Railroad Co. was chartered in 1835 by the legislatures of Kentucky, Tennessee, North and South Carolina to construct a railroad from Charleston, by way of Hamburg, to Louisville and Cincinnati. Although many and substantial privileges were granted in aid of the project, the time was not ripe for so great an undertaking, and it was abandoned, first in Kentucky, then in Tennessee, and finally in North Carolina. The South Carolina organization alone remained, and this purchased the South Carolina Railroad in 1837, and finished the Columbia branch in 1842. The Louisville, Cincinnati & Charleston Railroad Co. and the South Carolina Canal & Railroad Co. were formally consolidated under the name of "The South Carolina Railroad Co." on January 1, 1844. The first president of the consolidated company was Col. James Gadsden, who afterwards negotiated the Gadsden treaty with Mexico.

The following statement shows the section of railroad first built in each of the Southern States:

Name of Railroad First Built in State, and Termini.		Miles.	Year opened.
Maryland	Baltimore & Ohio—Baltimore to Ellicott's Mills	15.00	1830
District of Columbia	Washington Branch R. R.—Relay House, Md., to Washington, D. C.	4.00	1835
Virginia	Chesterfield—Richmond to Chesterfield Mines	13.00	1831
West Virginia	Baltimore & Ohio—Harper's Ferry to opposite Hancock	39.00	1842
North Carolina	Petersburg—Petersburg, Va., to Blakely, N. C.	63.00	1833
South Carolina	South Carolina Canal & R. R.—Charleston to a point west	7.00	1830
Georgia	Central—Savannah to a point west	9.00	1837
Florida	St. Joseph & Iola—St. Joseph to Lake Wimico	8.00	1836
Alabama	Tuscumbia to Decatur	45.50	1834
Mississippi	Vicksburg & Jackson—Vicksburg to Jackson	14.00	1841
Tennessee	Nashville & Chattanooga—Nashville to Murfreesboro	30.00	1851
Kentucky	Lexington & Ohio—Lexington to Frankfort	29.00	1835
Louisiana	Lake Ponchartrain—New Orleans to Lake Ponchartrain	5.00	1831
Missouri	Pacific—St. Louis to a point west	6.00	1852
Arkansas	Memphis & Little Rock—Memphis	5.00	1857
Texas	Buffalo Bayou, Brazos & Colorado—Harrisburg to Richmond	32.00	

The progress of construction of railroads in the South up to 1860 had not been especially rapid in comparison with other sections of the country, as in the fourteen States covered by this review there were at that time only 10,352 miles of line, representing an average of only 11.66 miles of railroad to each 100 square miles of territory, and of .995 mile of railroad to each 1000 of population. Between 1860 and 1865 construction was practically suspended, and in the next period of eight years, up to the close of 1873, the extensions of old lines and the construction of new roads in the entire section of country south of Maryland and east of the Mississippi river aggregated only 4200 miles, an increase of about 45 per cent., against an increase of 3700 miles, or 260 per cent. in the three States of Missouri, Arkansas and Texas.

As may be readily comprehended, the South had not sufficiently recovered from the disasters of the Civil War to withstand the far-reaching effects of a panic of such wide proportions as that which burst upon the country in 1873, and the ten States from Virginia to Louisiana (comprised in the South Atlantic and Gulf groups) did not present to capital an inviting field for the exploitation of new railroad enterprises. In consequence, the aggregate increase of mileage in these States in 1879 was only 1435 over the total of 1873, an increase of less than 10 per cent. in the aggregate, and an average increase of only 287 miles per year.

In July, 1877, evidences of a recovery from the panic of 1873 manifested themselves, and the improved feeling was maintained throughout 1878, becoming more and more accentuated as that year drew to a close, gold declining to par on December 17, after ruling at a premium since January, 1862, as a result of the government's action in selling, earlier in the year, $50,000,000 of 4½ per cent. bonds in anticipation of the resumption of specie payments on January 1, 1879.

The following extracts from "A Study in Railway Statistics," by this writer, and published in Poor's Manual in 1900, presents a review of the progress of work in the ten years from 1881 to 1890:

"In a country like our own the reaction following a protracted period of depression, such as existed in the years 1873-78, is accompanied by a constantly increasing demand for desirable corporate securities to such an extent that the ordinary channels of investment are speedily choked to overflowing. The superabundant capital of such periods naturally seeks those fields offering the best return, and of these none is so popular with the majority of investors as the securities of railway companies. When such securities of the established corporations are practically all absorbed, then capital seeks permanency in new ventures.

"The unparalleled impetus given to business enterprises of all kinds by the resumption of specie payments January 1, 1879, gave an impulse to the construction of railroads in this country such as has never been experienced in any country since that system of transportation was inaugurated. In the ten years beginning with 1881 there were added to the mileage of the country no less than 73,392 miles of railroad, at a cost for construction and equipment of $4,500,000,000, this sum including, of course, the cost of betterments to old lines. The average annual expenditures on railways in this period equalled $450,000,000.

"During these ten years, between the close of the years 1880 and 1890, the country and the world at large witnessed one of the most extraordinary achievements of our people in the unprecedented extension of our great transportation system, accompanied by a corresponding development in the perfection of the details of working, as well as a steady decrease in the charges for the transportation of freight and passengers.

"The expansion of the railway system of the country in this period from a total length in 1880 of 93,262 miles to 166,654 miles in 1890, representing an increase of 73,392 miles, or nearly 80 per cent., was one of the most remarkable achievements in the internal development of this country, where magnificent achievements have become so general as to rarely excite wonderment except among foreigners. The magnitude of the work accomplished, however, can be better comprehended when, as is shown elsewhere, the construction between 1880 and 1890 was equal to the entire construction in the forty-five States from 1830 to 1875, and was 5500 miles in excess of the aggregate mileage at the end of 1898 in the sixteen States comprised in the New England, Middle and Central groups.

"During these ten years the greatest activity in the construction of new lines of railroad was displayed, as might have been expected, in the section of the country west of the Mississippi river and east of the Rocky mountains. This section, subdivided into what is known as the Northwestern group and the Southwestern group, embraces the States of Iowa, Minnesota, Nebraska, North Dakota, South Dakota, Montana and Wyoming, which comprise the first-named group, and Missouri, Arkansas, Texas, Kansas, Colorado, New Mexico, Oklahoma and Indian Territory, which comprise the Southwestern group. In the Northwestern there was an increase in the ten years of 14,947 miles, the total at the end of 1880 having been 12,347 miles, while at the end of 1890 there were in operation 27,294 miles of road. This increase, enormous as it was, equalling 121.05 per cent., was, nevertheless, exceeded by the increase in the Southwestern group, in which the mileage expanded from 14,085 miles in 1880 to 32,888 miles in 1890, the increase of 18,803 miles equalling 133.5 per cent.

"While the period from 1880 to 1890 was remarkable in many respects, it was especially so in as far as the history of railway extensions is concerned—in having had, for example, constructed in two separate years the great totals of 11,600 miles and 12,982 miles of railroad, respectively; in two separate biennial periods, 21,377 and 21,095 miles, respectively; in two quinquennial periods, 35,294 and 39,492 miles, while in the two great triennial periods of 1881-83 and 1886-88 there were built 56,344 miles, or 30 per cent. of the total railroad mileage of the country in 1898.

"South of the Ohio river the construction of railroads was also vigorously prosecuted, the more important lines being named below:

	Miles.
Atlantic & Danville—Danville, Va., to Portsmouth, Va., and branches	282.00
Atlanta & Florida—Atlanta to Fort Valley, Ga.	105.00
Augusta, Gibson & Sandersville—Augusta to Sandersville, Ga.	80.00
Cape Fear & Yadkin Valley—Wilmington, N. C., to Mt. Airy, N. C., and branches	327.55
Chattanooga, Rome & Columbus—Chattanooga, Tenn., to Carrollton, Ga., and branches	158.00
Florida Southern—Palatka, Fla., to Brooksville, and branches, etc.	307.54
Georgia Midland & Gulf—Columbus to McDonough, Ga.	99.00
Georgia Southern & Florida—Macon, Ga., to Palatka, Fla.	285.00
Jacksonville, Tampa & Key West—Jacksonville, Fla., to Sanford, and branches	165.00
Marietta & North Georgia—Marietta, Ga., to Murphy, and branch	118.00
Macon & Northern—Macon to Athens	107.00
Pensacola & Atlantic—Pensacola, Fla., to River Junction	160.00
Savannah, Americus & Montgomery—Lyons, Ga., to Hurtsboro, and from Hillsboro west	228.00
Savannah & Western—Americus, Ga., to Birmingham, Ala., and branches	368.55
South Atlantic & Ohio—Bristol, Tenn., to Big Stone Gap, Va.	70.00
Western North Carolina—Salisbury, N. C., to Paint Rock, Tenn., and branches	327.55

"In this section also the older corporations were not to be distanced by their younger competitors in the race for territorial expansion, and in consequence many important extensions of their lines were built. A notable feature of the latter half of the decade was the surprising activity displayed in Georgia and in the mineral regions of Alabama."

STATEMENT SHOWING MILEAGE OF RAILROAD CONSTRUCTED BY YEARS FROM 1881 TO 1901, INCLUSIVE, IN THE STATE OF MARYLAND AND DISTRICT OF COLUMBIA, THE SOUTH ATLANTIC AND GULF AND MISSISSIPPI VALLEY STATES, AND THE STATES OF MISSOURI, ARKANSAS AND TEXAS.

1. *State of Maryland and District of Columbia.*

Years.	Md. and D. C. Miles.	Years.	Md. and D. C. Miles.	Years.	Md. and D. C. Miles.	Years.	Md. and D. C. Miles.	Years.	Md. and D. C. Miles.
1881	25.00	1886	41.50	1890	46.20	1894	2.40	1898	15.80
1882	33.00	1887	...	1891	3.00	1895	0.33	1899	19.00
1883	21.00	1888	12.78	1892	16.98	1896	27.00	1900	...
1884	12.00	1889	24.24	1893	11.00	1897	...	1901	42.16
1885	52.50								

2. *South Atlantic States.*

Years.	Va. Miles.	W. Va. Miles.	N. C. Miles.	S. C. Miles.	Ga. Miles.	Fla. Miles.
1881	327.00	11.00	159.00	52.00	103.50	145.00
1882	222.00	107.00	124.00	29.25	316.80	271.43
1883	103.00	134.00	31.00	40.75	54.80	192.18
1884	118.00	85.00	173.92	25.75	88.00	182.92
1885	13.00	21.00	49.00	100.00	133.75	272.34
1886	27.50	101.90	174.40	125.50	149.67	295.81
1887	61.95	80.54	189.90	90.45	230.28	211.68
1888	150.86	67.85	206.92	199.47	430.12	154.19
1889	289.11	53.37	314.85	48.54	338.00	133.29
1890	167.18	104.37	272.56	169.85	348.26	120.31
1891	209.29	109.18	101.98	199.32	289.73	85.98
1892	20.62	268.84	44.60	58.80	81.12	157.26
1893	23.62	106.02	124.75	17.30	168.99	167.60
1894	11.19	78.61	29.23	53.61	56.60	149.25
1895	39.66	97.95	60.66	18.18	85.50	75.75
1896	12.18	25.50	25.60	46.96	82.84	81.00
1897	27.50	68.25	33.80	12.01	134.72	34.18
1898	66.15	42.00	123.10	16.00	129.78	47.70
1899	56.50	44.18	85.58	139.70	97.35	135.00
1900	72.68	261.12	51.16	163.90	139.61	80.70
1901	34.50	275.10	92.25	90.50	201.75	75.00

3. *Gulf and Mississippi Valley States.*

Years.	Alabama. Miles.	Mississippi. Miles.	Tennessee. Miles.	Kentucky. Miles.	Louisiana. Miles.
1881	18.00	76.50	56.33	142.30	229.00
1882	70.00	100.50	165.44	72.70	95.81
1883	177.10	313.35	47.40	106.73	193.78
1884	96.26	228.21	55.99	24.33	112.00
1885	20.40	82.49	7.00	37.35	55.00
1886	44.56	154.72	40.44	70.05	9.50
1887	308.20	96.41	73.85	198.74	95.60
1888	383.32	88.50	201.64	303.33	41.80
1889	169.00	158.69	172.50	194.32	156.76
1890	280.81	74.41	163.70	170.93	104.61
1891	162.18	.....	220.61	31.13	153.38
1892	30.75	8.00	89.73	44.09	84.53
1893	57.61	12.72	28.83	45.31	26.00
1894	16.10	20.00	38.95	0.33	87.19
1895	51.48	7.03	.....	23.40	41.42
1896	41.01	55.00	41.07	26.50	147.26
1897	135.68	92.30	28.00	16.50	135.50
1898	150.30	41.00	6.00	19.00	160.28
1899	160.19	109.54	65.25	10.30	162.25
1900	156.47	153.26	79.53	26.10	154.75
1901	103.15	110.90	125.13	75.50	165.70

4. *States of Missouri, Arkansas and Texas.*

Years.	Missouri. Miles.	Arkansas. Miles.	Texas. Miles.	Years.	Missouri. Miles.	Arkansas. Miles.	Texas. Miles.
1881	242.35	143.50	1,669.40	1892	183.49	14.90	224.00
1882	259.54	486.25	1,095.54	1893	131.85	60.00	136.34
1883	118.06	245.08	81.00	1894	68.22	57.30	84.23
1884	100.03	33.50	113.00	1895	43.45	20.80	204.79
1885	259.02	41.08	190.50	1896	7.54	106.29	81.05
1886	126.24	122.00	578.96	1897	118.49	118.73	86.50
1887	516.99	157.65	1,165.42	1898	132.40	224.28	180.19
1888	259.97	81.78	241.35	1899	88.73	279.13	78.65
1889	100.88	97.00	295.41	1900	42.75	61.10	316.29
1890	186.67	70.65	223.19	1901	205.90	140.00	550.20
1891	50.87	95.38	126.98				

STATEMENT SHOWING TOTAL MILEAGE IN EACH OF THE SOUTHERN STATES IN 1880, 1890 AND 1901.

Name of States.	1880. Miles	1890. Miles.	1901. Miles.
Maryland	1,019	1,270.04	1,381.50
District of Columbia	21	20.66	24.88
Virginia	1,893	3,359.65	3,829.50
West Virginia	691	1,433.30	2,740.05
North Carolina	1,486	3,128.17	3,813.04
South Carolina	1,427	2,289.15	3,010.75
Georgia	2,459	4,600.80	5,930.07
Florida	518	2,489.52	3,331.75
Alabama	1,843	3,422.20	4,300.25
Mississippi	1,127	2,470.85	3,044.15
Tennessee	1,843	2,767.38	3,310.06
Kentucky	1,530	2,942.38	3,171.75
Louisiana	652	1,739.85	2,961.50
Missouri	3,965	6,142.02	7,088.75
Arkansas	859	2,203.44	3,264.50
Texas	3,244	8,709.85	10,541.65
Totals	24,577	48,989.26	61,744.75

In 1880 there were in the ten States comprised in the South Atlantic and Gulf groups 173 railroad corporations, this number including companies whose lines were at that time operated by other corporations under lease or other agreement. The total length of all lines within that section increased during the twenty-one years from 1881 to 1901, inclusive, 21,994 miles to 39,443, the rate of increase equalling 142 per cent. In 1890, when the total mileage of these groups was 37,129 miles, the number of corporations had increased to 375, of which only 193 were operating companies, the other 182 being companies whose lines were leased to the active corporations.

Notwithstanding the increase in the number of corporations from 173 in 1880 to 375 in 1900, the tendency to the absorption of weaker lines by the greater corporations and the growth of systems which is so general throughout

all sections of the country, but at the moment most noticeable in the Western States, has also been active in the South.

The appended statement presents interesting statistics showing the expansion by consolidation, extension, etc., of the eleven largest corporations in all the States but Missouri, Arkansas and Texas:

STATEMENT SHOWING THE OPERATIONS OF ELEVEN OF THE LEADING SOUTHERN RAILROAD SYSTEMS, COMPARING 1880 AND 1900.

	Mileage, December 31, 1880.			Mileage, December 31, 1900.		
Name of Company.	Owned. Miles.	Leased, operated, controlled and trackage. Miles.	Total. Miles.	Owned. Miles.	Leased, operated, controlled and trackage. Miles.	Total. Miles.
Baltimore & Ohio	436.40	1,129.83	1,566.23	547.63	3,196.74	3,744.37
Chesapeake & Ohio	436.80	.....	436.80	922.87	635.13	1,558.00
Norfolk & Western	428.00	.....	428.00	1,551.14	3.51	1,554.65
Southern[1]	2,502.90	1,208.32	3,711.22	3,775.62	3,156.17	6,931.79
Atlantic Coast Line[2]	735.45	2.00	737.45	1,972.11	2.00	1,974.11
Plant System[2]	666.98	18.00	684.98	2,085.49	55.45	2,140.94
Seaboard Air Line[2]	936.80	.....	936.80	2,496.55	60.65	2,557.20
Georgia R. R. & Banking Co.	301.00	4.00	305.00	303.00	82.50	385.50
Louisville & Nashville	1,441.23	397.97	1,839.20	3,118.79	516.23	3,635.02
Nashville, Chatt. & St. Louis.	453.50	55.00	508.50	797.68	136.82	934.50
Mobile & Ohio	507.10	.....	507.10	753.86	160.60	914.46
	8,846.16	2,815.12	11,661.28	18,324.74	8,005.80	26,330.54

[1]Consolidation in 1894 of the Richmond & Danville Railroad and other companies.
[2]Not in existence as a system in 1880.

During the period of twenty years covered by the above table, from January 1, 1881, to December 31, 1900, it will be seen that the mileage operated by the eleven systems given shows an increase of 14,669.26 miles, of which 9478.58 were in mileage owned and 5190.68 in leased mileage. Of the mileage owned, 6548.21 miles were added through construction of the parent companies, 670.32 miles by consolidation of lines that were separately operated in 1880, and 2244.30 by construction and extension since 1880 of the said consolidated lines; also 55 miles previously leased, but not consolidated with lessor company—total 7966.72 miles, from which deduct lines abandoned, etc., 47.99 miles, leaving a net increase of 7918.73 miles, as above. Of the increased leased mileage, 1705.94 miles were in operation in 1880; 3078.11 miles were added subsequently through construction, and "trackage" during the period increased 554.34 miles, making a total of 5287.74 miles. From this deduct decreases through consolidation, surrender, etc., 155 miles, and net sundry lines abandoned, 2.71 miles—total 157.71 miles, leaving net increase in leased lines 5190.68 miles, as shown above.

One of the most important events of recent years in the line of railway development in the South was the opening, in June, 1900, of the Seaboard Air Line as a through line to Tampa, Fla., which event was celebrated with appropriate ceremonies.

The nucleus out of which has grown the present Seaboard Air Line railway system was the old Seaboard & Roanoke Railroad, extending from Portsmouth, Va., to Weldon, N. C., a distance of eighty miles. The principal owners of that road were also interested in the Raleigh & Gaston Railroad, extending from Weldon to Raleigh, N. C., about ninety-eight miles, and the Raleigh & Gaston Railroad Co. in turn controlled the Raleigh & Augusta Air Line, from Raleigh to Hamlet, N. C., also about ninety-eight miles. So that as long ago as 1880 the ownership of the line from Portsmouth, Va., to Hamlet, N. C., may be said to have been held in a sort of a community of interests. The direct control of the Raleigh & Gaston and of the Raleigh & Augusta Air Line passed eventually to the Seaboard & Roanoke, but at what time does not appear. In 1882 the Seaboard & Roanoke Railroad Co. acquired control of the Carolina Central Railroad, extending from Wilmington to Shelby, N. C., a distance of 242 miles, and afterwards shared the control with the Raleigh & Gaston Railroad Co. In 1884 the Raleigh & Gaston built the Louisburg branch, ten miles, and the Raleigh & Augusta Air Line was extended from Hamlet to Gibson, N. C., ten miles, in the same year. The Carolina Central was extended from Shelby to Rutherfordton, twenty-five miles, in 1887. At about this time the railroad began to be known as the Seaboard Air Line system, and it is probable that this was when the Seaboard & Roanoke acquired control of the Raleigh & Gaston. At any rate, the acquisition was first made public at this time. The system then extended from Portsmouth, Va., to Gibson, N. C., 285 miles, and from Wilmington to Rutherfordton, N. C., 267 miles, and there were branches to Louisburg and to Pittsboro, twenty-two miles. The Baltimore Steam Packet Co., running steamers between Baltimore, Newport News, Norfolk and Portsmouth, was operated in connection with the railroad, and a New York connection was supplied by the Old Dominion line of steamships, in which the Seaboard Air Line held a large interest.

About April 1, 1899, a connection was made with the Norfolk & Western system through the construction of the Durham & Northern Railroad, from Henderson to Durham, N. C., forty-two miles. The Roanoke & Tar River Railroad, extending from a connection with the Seaboard & Roanoke Railroad to Lewiston, N. C., was constructed in 1887 and leased to the Seaboard & Roanoke Railroad Co. The construction of the Georgia, Carolina & Northern Railroad, to run from Monroe, N. C., to Atlanta, Ga., was commenced about the same time, and was added to the system as fast as completed. The line was opened on April 24, 1892. The Palmetto Railroad, from Hamlet, N. C., to Cheraw, S. C., was added to the system in 1895, being leased to the Raleigh & Augusta Air Line Railroad Co.

In the fall of 1898 a syndicate headed by John L. Williams & Sons of Richmond, Va., and Middendorf, Oliver & Co. of Baltimore bought a controlling interest in the Seaboard Air Line. These persons were already principal owners of the Georgia & Alabama. Early in the following year they bought a controlling interest in the Florida Central & Peninsula. These three lines form the basis for the new consolidation. When taken over, their mileage, stocks and bonds were substantially as follows:

	Mileage.	Stock.	Bonds.
Seaboard Air Line	951.3	$7,258,650	$14,160,000
Georgia & Alabama	457.8	9,350,000	5,405,000
Florida Central & Peninsula	941.3	24,500,000	9,820,000
Total	2,350.4	$41,108,650	$29,385,000

STATEMENT SHOWING THE RESULTS OF THE OPERATIONS OF THE RAILROADS DOMICILED IN THE SOUTH ATLANTIC AND GULF AND MISSISSIPPI VALLEY STATES (ELEVEN STATES) FOR THE YEARS 1880, 1890 AND 1900.

	1880.	1890.	1900.
Miles railroad operated	14,243.12	24,123.68	33,375.97
Passengers carried	7,463,694	33,170,601	38,748,099
Passenger mileage	329,481,519	1,156,555,080	1,494,948,815
Tons freight moved	15,866,522	71,965,956	105,939,011
Freight mileage	1,645,676,142	7,540,077,034	16,308,409,100
Traffic earnings:			
Passenger	$11,577,385	$28,985,693	$35,812,587
Freight	35,499,536	78,068,917	120,183,947
Miscellaneous	2,095,509	8,404,888	14,041,700
Total	$49,172,430	$115,459,498	$170,038,234
Net earnings	16,973,396	37,132,752	52,816,581
Interest paid	11,264,350	25,903,502	28,129,420
Dividends paid	3,510,426	6,615,370	7,522,015

In explanation of the above table and the difference between the mileage shown and that actually within those States, it should be borne in mind that as it is impossible to arrive at the earnings of railroads according to their mileage in each State, the figures shown are only for such lines as are apportioned to these groups of States according to the system followed for many years by Poor's Manual of Railroads.

COMPARATIVE STATEMENT SHOWING, FOR LEADING TRUNK LINES OF RAILROAD IN THE SOUTHERN STATES, A SUMMARY FOR THE YEARS 1880, 1890 AND 1900, OF THEIR CAPITAL STOCKS AND BONDED DEBTS, MILEAGE OWNED AND MILEAGE OPERATED, PASSENGER TRAFFIC, FREIGHT TRAFFIC, EARNINGS, EXPENSES AND NET EARNINGS.

	1880.	1890.	1900.
Number of railroad systems	8	8	11
Miles railroad owned	4,121.66	7,840.32	14,922.00
Capital stock	$100,589,270	$285,868,612	$500,884,500
Bonded debt	90,454,920	255,783,641	540,433,839
Total stock and bonds	$191,044,190	$541,652,253	$1,041,318,339
Capital stock per mile railroad owned	$24.405	$36.461	$33.500
Bonded debt per mile railroad owned	21.946	32.624	36.219
Total stock and bonds per mile	$46.351	$69.085	$69.719
Miles railroad operated	4,168.56	11,357.11	20,291.00
Passengers carried	5,429,953	21,579,146	41,717,224
Passenger movement (passengers one mile)	233,334,579	872,466,184	1,319,015,454
Freight moved (tons)	8,393,761	38,810,191	85,937,212
Freight movement (tons one mile)	1,362,384,716	5,767,904,118	17,040,797,092
Passenger earnings	$5,042,001	$20,090,325	$29,027,885
Freight earnings	15,864,112	45,942,984	107,219,694
Other earnings	2,998,979	6,127,395	11,606,888
Gross earnings	$23,905,092	$72,160,704	$147,854,467
Operating expenses	13,909,505	47,293,049	101,721,310
Net earnings	$9,995,587	$24,867,655	$46,133,157

STATEMENT SHOWING TOTAL TRACK MILEAGE, EQUIPMENT, CAPITALIZATION AND BONDED DEBT OF ALL STREET RAILWAYS AND TRACTION LINES (CITY, SUBURBAN AND INTERURBAN) IN THE FOLLOWING SIXTEEN STATES.

States.	Total track mileage. Miles.	Motor cars. No.	Passenger cars, etc. No.	Stock.	Bonds.
Maryland	393.80	1,222	360	$15,340,000	$50,692,694
District of Columbia	240.19	266	948	30,254,398	24,048,000
Totals	633.99	1,488	1,308	$45,594,398	$74,740,694
Virginia	262.97	186	326	$8,901,250	$12,540,000
West Virginia	114.00	21	173	3,203,000	3,949,000
North Carolina	55.51	35	70	1,384,800	936,500
South Carolina	68.00	16	24	2,262,000	2,850,000
Georgia	285.24	203	209	6,171,000	9,610,000
Florida	69.80	35	75	1,031,000	704,200
Totals	855.52	496	977	$22,953,050	$30,589,700
Alabama	202.98	160	184	$2,936,000	$4,377,000
Mississippi	36.56	37	48	918,000	620,000
Kentucky	256.82	531	303	11,252,000	11,224,300
Tennessee	275.94	400	140	8,903,000	7,544,000
Louisiana	204.73	515	59	10,119,800	10,078,000
Totals	977.04	1,643	734	$34,128,800	$33,853,300
Missouri	1,172.83	734	1,776	$71,009,300	$66,698,670
Arkansas	48.80	49	65	1,020,500	1,330,500
Texas	289.83	317	174	7,933,000	7,945,000
Totals	1,511.46	1,100	2,015	$79,962,800	$75,974,170
Recapitulation.					
Maryland and Dist. of Columbia	633.99	1,488	1,308	$45,594,398	$74,740,694
South Atlantic States	855.52	496	977	22,953,050	30,589,700
Gulf and Mississippi Val. States	977.04	1,643	734	34,128,800	33,853,300
Southwestern States	1,511.46	1,100	2,015	79,962,800	75,974,170
Grand total	3,978.01	4,727	5,034	$182,639,048	$215,157,864

Florida Full of Prophecy

By Governor William S. Jennings

Twenty years ago, had some one dipped his pen into imagination and written, as a prophecy, the half that has actually been accomplished in Florida in the past two decades, he would have been called a dreamer of dreams too wild to be even entertaining.

To predict the future, let us look into the past. Twenty years ago the State had a little more than 300 miles of railway and its rivers as means of transportation and communication; today it has over 3500 miles of railway. Twenty years ago it had a population of 269,493 souls; now there are 535,689 people in Florida. The property of the State twenty years ago was valued at about $32,000,000; today it is over $300,000,000 in value.

Twenty years ago there were less than a dozen banks in the State, with about $250,000 capital; now there are upwards of forty banks, with a capital of $3,000,000 and deposits aggregating $11,000,000.

Twenty years ago the middle and lower peninsula was almost an unbroken wilderness; today railroads and steamboats penetrate almost every quarter, and thousands of busy workers are adding new miles of rails to the roads already built, while new roads and improved waterways are reaching out into new territory. The wilderness of twenty years ago is dotted over with thriving villages, beautiful farms and groves and the happy homes of a prosperous, contented people.

This is only a part of the growth of twenty years. Who can with any certainty predict the future of the State? It has for its known resources inexhaustible beds of phosphate, immense deposits of kaolin clay and fuller's earth, with beds of cement, the area of which are as yet only conjectured, while iron and other metals and minerals are known to exist in quantities, but have not yet been examined to determine their extent. What is known to exist but suggests the existence of equally, if not more, valuable treasures hidden away in the earth.

The streams and waters in and around the State teem with fish in endless variety, oysters, shrimp, giant crayfish and sponge—illimitable wealth for the taking, while the forests hold fortunes in their billions of feet of lumber and their immense quantities of naval stores. Every section of the State can show its streams and great springs, exhaustless and unlimitable power for manufactures of every description, or the generation of electricity for lighting purposes, for driving machinery or for transportation. All these things are at the door only waiting the moment to spring into active being.

The experience of the past has shadowed forth the future, and a few years will see Florida producing millions of pounds of sugar, her rice will be in every market, her cigars will be the joy of all lovers of fine tobacco, her fruit will be known and appreciated by all, and her vegetables will supply the wants of less-favored sections, while her fish and oysters will reach every hamlet in the land. These are the products Florida can promise from her land and her water, but these are not all.

We are getting a glimpse into the future through the opening door of the new century, and we can see railways and waterways reaching into every corner of the State. Trains and steamboats and ships are gathering and transporting the manifold products of land and water to the consumers, while factories are turning raw materials into cloth, earthenware, china, fertilizers, cement, starch, preserves, jellies and all varieties of canned goods. Florida, the consumer, will become Florida, the producer, and instead of buying to feed her people, will, from her abundance, sell to feed and clothe her neighbors.

The varieties of stock food and the quantity that can be so easily produced; the fact that cattle, sheep, goats and hogs need but little and inexpensive protection against weather, and the ease with which animals are raised, and the further fact that this condition is rapidly becoming thoroughly understood not alone by the stockmen of Florida, but by those of the North and West, warrants the belief that Florida will eventually become one of the greatest producers of beef, pork, mutton, butter and cheese in the Union.

Sooner or later the manufacturers of fine pottery will find it to their advantage to establish their factories near the kaolin-clay beds for convenience and economy, and because the mild climate will enable them to readily convert the raw material into ware at comparatively little cost.

Florida is now shipping large quantities of timber and lumber to South American countries, but in the event of the early construction of an inter-oceanic canal this business will increase to an enormous extent. That which leaves here now as lumber will then go in the shape of buildings, ready, on their arrival at their destination, to be put together for immediate use. The manufacture of sash, doors, blinds, moldings and other finishing work, already quite an extensive business, will within the next few years largely increase, because of the need to convert into merchantable material the timber of the exhausted turpentine farms, and this, too, will find its way to foreign marts.

Our people need to learn something to help the progress of the State and to add to their own growing wealth. They need to learn that their forests should be guarded against destruction, that their fish and game must be protected to prevent wasteful killing, and that their fruits and vegetables should be carefully inspected and the packages branded before leaving the State, so that nothing but good, sound, ripe fruit and vegetables of the first quality only shall be put upon the market, to command the highest price wherever they are offered for sale.

The total debt of Florida is $1,032,500, of which $148,000 is held by individuals, and the remainder, $884,500, is held by the several educational funds of the State, bearing interest at 3 per cent. She has no floating debt, and has the lowest tax-rate of any State in the Union except New Jersey. Extensive improvements have been made during the past year in the school properties of the State, and the work of remodeling the Capitol building is now in progress. The cost, when completed, will be $75,000. All these additional expenses that have been incurred have been met, and those to come will be met without any increase in the rate of taxation. No State in the Union is in better financial condition or has a brighter outlook for the future than has Florida.

W. S. Jennings

Sugar Interests of the South

By W. C. STUBBS

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Director of the Louisiana Sugar Experiment Station

Any account of the resources of the South and a recital of their development in the last twenty years would be incomplete without an article upon the sugar industry—an industry which, despite the many serious obstacles it has encountered, has expanded until it occupies the larger portion of South Louisiana, a goodly part of East Texas, and constitutes an important item in crop production in all the counties adjacent to the Gulf of Mexico and Atlantic ocean in the States of Mississippi, Alabama, Florida, Georgia and South Carolina.

W. C. STUBBS.

From De Boré's first crop of $12,000 in Louisiana, the annual output of sugar, syrup and molasses has grown in value far up into the millions. The crop of 1900 in Louisiana alone required $35,000,000 to market it. If to this be added the sugar crop of Texas, now rapidly expanding, and the syrup crop of the small farmers, it would not be far wrong to place a value of at last $50,000,000 upon the sugar-cane industry of the Southern States.

While the increase in value has been enormous, the improvements in methods and machinery have been almost incredible. De Boré's small sugar-house, with its horse mill and iron kettle, has been supplanted by the modern central factory, with its ponderous nine-roller mills and crushers or diffusion batteries, with improved superheaters, clarifiers and filter presses, with the multiple vacuum effets, with immense vacuum pans and capacious centrifugals.

Formerly the horses and oxen propelling the mills were sustained by the tops of cane. Today the great boilers which generate the steam that propels the ponderous rolls and evaporates millions of tons of water from the extracted juice are "fueled" mainly with the refuse of the cane (bagasse) which their own force has created.

So complete has been the change that not only De Boré and his colleagues of that early day, but the ante-bllum planters—yea, even those who essayed the re-establishment of the industry after the Civil War—would be strangely out of place in a modern, up-to-date central factory.

The improvements have not been confined to the factory. Agriculture has kept an even pace with manufacture. The primitive plow and home-made drags have been supplanted long since by the improved steel turn-plow and revolving harrow, and these in their turn succeeded in late years by the disc plow, harrow and cultivator. Improved implements have largely displaced hand labor, and the hoe gang, formerly in evidence in every field, is now being rapidly relegated to the realm of "innocuous desuetude" by the ingenious horse hoes and cultivators found on nearly every plantation. Even a cane-harvester, now being evolved from the brain of genius, is constantly expected and eagerly awaited everywhere as the first valuable contribution of the twentieth century to the sugar industry.

Drainage is now recognized as the prerequisite of large production, and irrigation is discussed by all and practiced by a few as an essential to uniformly good crops.

The alluvial lands of the sugar country were once deemed of inexhaustible fertility, and an effort to supply artificially fertilizing ingredients thereto would have been regarded as the act of a madman or the dream of a visionary, yet the opening years of the present century find every planter applying enormous quantities of tankage, cottonseed meal, acid phosphate, etc., to these very soils, and his act is amply justified by the annual increase of crop. Science has demonstrated that properly-selected fertilizers judiciously applied will enhance acre yields even on the richest soils.

A triennial rotation of plant cane, stubble cane and corn and cowpeas has been almost universally established, and so strong is the confidence in the efficacy of this rotation that prices of $2 to $3 per bushel for cowpeas do not deter a single planter from its practice.

This wonderful development has been attained amidst almost insuperable difficulties. Floods have repeatedly inundated entire sections and destroyed thousands of acres of cane. Pestilence, "that walketh in darkness," has several times smitten the sugar districts. The Civil War completely prostrated the industry, and reconstruction kept it prostrate for many years thereafter. Healthful recuperation became visible only after the overthrow of the carpet-bag government and the re-establishment of law and honesty. Low prices and unreliable labor have sometimes shorn the industry of all of its profits.

Coolie-raised or bounty-fed sugars of other countries have occasionally, by competition in our local markets, lowered the price of sugar below the cost of production. And lastly, perhaps the most formidable obstacle of all, is the want of permanency in our national legislation, a defect inherent in our form of government, which gives the people the opportunity every four years of changing the political policy of the country. The apprehension of reciprocity treaties with foreign countries by which sugar will suffer is today checking

seriously, but temporarily, let us hope, that progress of the industry which the capitalist and the planter would otherwise develop.

All of these have militated against the advance of the sugar industry, and yet it has attained such a degree of excellence that Louisiana is now justly esteemed as the leader of the sugar-cane world, and is sending daily words of intelligence and experience to every tropical sugar country.

This progress, marvelous as it has been in the aggregate, has been achieved through much suffering, large expenditures of money, and unceasing activity of brain and hand, at times advancing with almost imperceptible gradations, at others with leaps and bounds. It can be proven that nearly every dollar made by the sugar-planters of the South since 1880 has been expended in the improvement of their estates and in the enlargements of their sugar-houses, until today they together represent an investment exceeding $100,000,000. Some idea of the progress in the march of improvement in the manufacture of sugar may be obtained when it is asserted that some sugar-houses in this State have been rebuilt three times in the last twenty years, each time with larger and more improved machinery, to meet the increasing crops of the plantation and to decrease the cost of manufacture, for, be it remembered that an increase in the capacity of a sugar factory means a decrease in the cost of manufacture of a pound of sugar.

These are the results in the field and factory, but there are indirect results in the cities to which the sugar is shipped well worthy of mentioning. No agricultural industry contributes so much to the public carriers as sugar. Our railroads transport a large part of the cane from the fields to the factories. The average tonnage in Louisiana is about twenty-two tons. An average car will carry fifteen tons; therefore, each acre furnishes one and one-half carloads of cane, which, at sixty cents per ton, about the average price paid, gives the railroads an income of $13.20 from each acre of cane grown. This is for the transportation of the raw material to the factory. Two tons of cane will give a barrel of sugar, and this must go to the market. Each acre will thus supply about eleven barrels of sugar, upon which freight varying from twenty-five to seventy-five cents per barrel will be collected. It is possible, therefore, for a railroad in a sugar section to realize *at least* $15 in freight for each acre of cane grown along its line.

Compared with cotton, the profits of sugar-growing to a railroad is significantly emphasized. The average yield of cotton in this State does not exceed half a bale per acre. It will therefore require two acres to furnish a bale of cotton and thirty bushels of cottonseed. If both are shipped to market over the railroad, the prevailing prices would not give the latter more than $2 to $2.50 in freight from two acres in cotton.

The sugar industry has created in the cities of the country (mainly New Orleans, the largest American sugar market) various and valuable industries. Factors, brokers and bankers receive and distribute its products and share in the profits. Warehouses obtain storage charges. Foundries and machine shops, employing thousands of skilled mechanics, are engaged in the supply and repair of sugar-house machinery. Cooper-shops manufacture the barrels and hogsheads used in casing the products. The implement men, the mule dealers, the coal and oil sellers, the fertilizer agents *et id omne genus*, are all conveniently established to solicit the trade of the planters. In fact, the sugar-planter of today may be regarded simply as a "money-changer," exchanging every dollar received for labor, material, provisions and clothes. After careful investigation and patient study of the facts as they exist, it may be truly said that of the $35,000,000 annually received for the sugar grown in this State, every dollar is paid out as fast as received, and a portion of it doubtless finds its way to every State in the Union, creating an interstate commerce of nearly $70,000,000 annually.

The following is an approximate distribution:

To Pennsylvania, Tennessee, Alabama, New York and Illinois, $6,000,000 for machinery.

To Mississippi and Louisiana, for brick and lumber, $600,000.

To Kentucky, Tennessee, Missouri, Indiana and Texas, for mules and horses, over $1,000,000.

To Pennsylvania, Alabama, West Virginia and Texas, for coal and oil, $1,500,000.

To Minnesota, Missouri and Kansas, for breadstuffs, $3,000,000.

To Illinois, Missouri, Kansas and Iowa, for stock feed, $3,000,000.

To West Virginia, Ohio, Illinois, Missouri and Kentucky, for wagons, carriages and agricultural implements, $500,000.

To Ohio, Indiana, Illinois, Missouri and Nebraska, for meats and lard, $3,000,000.

To Wisconsin, Illinois and Indiana, for butter and cheese, $500,000.

To Texas, Mississippi and Alabama, for beeves, exclusive of refrigerated beef from the West, $500,000.

To Alabama, for lime for building purposes and for use in factories $500,000.

To Ohio, Indiana and Illinois, for cooperage, $1,000,000.

To Georgia, South Carolina and Tennessee, for cowpeas, $300,000.

To Florida, South Carolina and Tennessee, Illinois, Missouri, Nebraska and Louisiana, for phosphates, cottonseed meal and tankage, $500,000.

To Boston, St. Louis, New York, Philadelphia, etc., for shoes, $1,500,000.

To New York, Chicago, Philadelphia and Baltimore, for clothes, $5,000,000.

If there be anything left it is spent for notions, fruits and sundries, which are gathered from Maine to California.

It will thus be seen that the development of the sugar industry in Louisiana has benefited nearly every section of the country.

As before remarked, prior to the year 1880 the sugar crop was very precarious. Only once (in 1878) did the yield reach above 100,000 tons.

In 1877 there was formed in the city of New Orleans the Sugar-Planters' Association, which at once became a powerful factor in developing the industry. For the first time, in 1880, syrup was sent by the small sugar-houses to the larger factories to be grained into sugar. This was the beginning of the central-factory system in the State. In 1881 the Mississippi river commission was created by Congress, which, in addition to the improvement of the navigation of the Mississippi river, has also aided in the construction and maintenance of the levees, and protected the lands from overflow.

In 1885, through the action of the Sugar-Planters' Association, the sugar experiment station was established, which has been of incalculable benefit to the planters of the State by its experiments in the field, laboratory and sugar-house.

Since 1886 the industry has grown in acreage planted, in improvements, in fertilizing and cultivating the cane, as well as in the efficiency and capacity of the sugar-houses.

It is true that the number of sugar-houses is gradually diminishing, but the aggregate capacity is yearly increasing. The following table, taken from Bouchereau's Reports, shows the quantity of sugar raised in Louisiana from 1880 to the present year in tons of 2240 pounds:

	Tons.		Tons.		Tons.
1880	121,886	1887	157,970	1894	317,306
1881	71,304	1888	144,878	1895	237,720
1882	136,167	1889	128,343	1896	282,009
1883	128,318	1890	215,843	1897	310,447
1884	94,372	1891	160,937	1898	245,511
1885	127,958	1892	201,816	1899	147,164
1886	80,858	1893	265,836	1900	[1]325,000

[1]Estimated—not from Bouchereau.

The crop just harvested for 1901 can as yet only be estimated. Notwithstanding the scarcity of labor and the early freezes caused a loss of perhaps 10 per cent of the cane grown, it is believed that the crop will be the largest on record, and will probably reach 350,000 long tons.

An examination of the above table will show a steady increase from 1886 up to the present, with fluctuations due to the prevailing seasons. In 1891 a prolonged drouth seriously injured the crop, while severe frosts are accountable for the small yields of 1886 and 1899.

The cane heretofore cultivated throughout the South has been of the purple variety, with its ancestor, the "purple striped." Many varieties have been at various times imported and tried without success.

In recent years the sugar experiment station has imported a larger number of seedling canes, developed in the tropical islands. Of these seedlings, two have proven worthy of extensive trial, and accordingly have been distributed among the planters and farmers of the South. On the sugar experiment station they have done well in the field and sugar-house, and it is confidently expected that they will, when universally planted, largely increase the sugar output of this State. They came from Demerara, and are designated D. 74 and D. 95.

Many obstacles to sugar culture are such as are encountered in the cultivation of any crop. Drouths and excessive rainfalls are injurious to crops everywhere, while severe cold frequently destroys the fruit crop, and sometimes the wheat crop of the North and West. From a climatic standpoint the growing of sugar-cane presents no more obstacles than accompanies the cultivation of other crops. Year in and year out, it is about as certain as our cotton or wheat crops, and no one has yet assigned a failure in either of these crops to their being exotic and unadaptable to our climate.

The most serious obstacle our planters have encountered in the past has been the occasional crevasses and overflows destroying the growing cane. A cane crop once destroyed requires several years for its restoration, and therefore an overflow to a sugar-planter is almost fatal. Fortunately, the national government, after years of neglect and indifference, recognized its obligation to the riparian dwellers of the Mississippi in the creation of the Mississippi river commission in 1881, whose duty it is to improve the navigation of the river and works connected therewith. It therefore included the construction and maintenance of levees. This action on the part of the national government was promptly seconded and supplemented in Louisiana by the creation of levee districts, with power to issue bonds, levy and collect specific taxes, and erect and maintain efficient levees. From the issue of bonds and proceeds of levee taxes, supplemented with appropriations from the Mississippi river commission, the levees of the State have been rebuilt, strengthened and raised everwhere three feet above the highest waters known. It is believed that the day of overflow is gone. There is a possibility that caving banks, crayfish holes, etc., may even now occasionally produce a crevasse and temporarily overflow a restricted area of land, but a general overflow caused by extreme high water is now believed impossible. There are in the State about a dozen levee districts, each controlled by a separate board, the members of which are appointed by the governor of the State. These boards, with the assistance of the State engineers, build and maintain the levees of the State, utilizing the funds derived from taxes self-imposed by the dwellers in each district upon his own lands and products. They have succeeded, with the help of the national government, in erecting powerful levees everywhere at a cost high up in the millions, and have maintained them for years during flood periods. Such confidence is shown in these levees that the dwellers behind them feel almost as secure in flood seasons as those who occupy the bluff and hill lands of the State. The confidence of the financial world in them is exhibited in the high values of the bonds of the various levee boards, all of them being well above par.

The greatest obstacle to the development of the sugar industry of Louisiana is now happily reduced to a minimum, if not entirely removed.

Sugar has been an ideal producer of tariff ever since the national government was founded, save from 1890 to 1893, when a bounty was given to the local producers.

A duty of one cent per pound on brown and three cents on refined sugar was imposed in 1789. These amounts were soon increased to two and one-half and four cents per pound. In the war of 1812 it was raised to five cents per pound, but lowered again in 1816. These duties were imposed strictly for "revenue only," since no sugar was then made in the United States, and were continued up to 1832, when the "compromise act" was adopted, which operated till 1842, when brown sugar was again taxed two and one-half cents per pound. In 1846 a 30 per cent. ad valorem tax was established, which remained until 1857, when it was lowered to 24 per cent., ad valorem, and so remained until the Civil War. During the war it fluctuated from three-quarters of a cent to three cents per pound, the latter figure prevailing until 1869, when it

was reduced to two cents. In 1873 it was raised to two and one-half cents per pound, and remained at this figure until 1890, when the bounty of one and three-quarters and two cents per pound was given the local producers in lieu of tariff. Under the Wilson bill the bounty was abolished, and an ad valorem of 40 per cent., with differentials of one-eighth and one-tenth of a cent a pound, was levied. This continued until after the inauguration of Mr. McKinley as President, when the Dingley bill was passed, giving from one and one-half to 1.95 cents per pound on sugar, according to purity.

From 1890 to 1893 is the only period in the history of the United States that brown sugar was admitted free. At all other times it has averaged two cents per pound.

It is, therefore, with feelings akin to horror, and a righteous indignation almost irrepressible, that the sugar-planters of the State look upon the proposed reciprocity with Cuba, by which a portion, if not all, of the duty now imposed on foreign sugars will be remitted. The time, too, is inopportune, since the enormous beet crop of Europe has forced down the price of sugar in the world's markets to a point believed to be everywhere below the cost of production.

The Syrup Industry.

Besides the sugar industry of Louisiana and Texas, there is, in the aggregate, an enormous syrup industry scattered throughout all of the South Atlantic and Gulf States. Sugar-cane is grown by the small farmers in patches from a fraction of an acre up to even 150 acres. This cane is grown and manufactured in the most primitive manner. Small horse mills, extracting not more than 50 per cent. of juice on the weight of the cane, are in use on every farm. Kettles and shallow pans heated over open fires are used for the concentration of juice to syrup. No re-agent save heat is used in clarification, and the loss in scums, which are usually thrown away, is enormous. These patches of cane may be seen by the traveler on the railroads almost continuously from Charleston, S. C., to New Orleans, La. The cane is grown upon the light, sandy pine lands of the tertiary and coastal plain belts. By proper fertilization excellent crops are produced. The cane grown upon such lands is much richer in sugar than that grown in the alluvial section, and to a central factory making sugar would be worth more per ton. Even by such wasteful methods the aggregate of syrup made is enormous, and, after supplying the home demand, is sent in large quantities to the North and West, where it fetches highly remunerative prices. There have recently been established at various points in Alabama, Georgia and Florida syrup factories, where large areas of cane are annually manipulated into syrup. The syrup industry has received within the last two years a powerful stimulus through the energetic efforts of Capt. D. G. Purse, president of the Board of Trade, Savannah, Ga. He has thoroughly studied the sugar industry of Georgia, Florida and South Carolina, and has called the attention of capitalists to this inviting field for investment in central factories. He has held public meetings all through this section, and addressed the farmers upon the necessity of more advanced methods in cane culture and more economical and intelligent processes of manufacture. He has had the writer, of Louisiana, and Dr. Wiley of Washington to visit this cane section, analyze the canes, and make public report of the work. Dr. Wiley has also investigated the soils of this section, and his results, together with analyses of a large number of canes, will soon be published in a special bulletin from the Department of Agriculture at Washington. Captain Purse is now laboring with the Georgia legislature for the establishment of a sugar experiment station somewhere in South Georgia. The area devoted to cane is constantly increasing, and the methods of manufacture gradually improving, and a recent personal inspection of this section gives assurance that when the intelligent and progressive practices of the best sugar-producing countries are universally adopted, sugar and syrup can be grown successfully in competition with the world. The saccharine richness of the cane and the abundance of cheap labor are favorable factors in preparing a solution of the above problem. Another significant fact upon which to base a convincing argument in favor of central factories is found in the ever-widening area devoted to cane, and the presumably profitable returns obtained for syrup made by crude and wasteful methods.

It is almost certain, if no unfriendly legislation occurs in the near future, that this syrup industry will continue to expand until it shall have assumed proportions but little inferior in value to the sugar industry of Louisiana and Texas.

Allusion has been made to the greatly increased yields in both field and factory.

In our field may be found every evidence of progress. Thousands of tons of fertilizers are annually consumed. Large turn and disc plows invert the soil with its cover of cowpeas. Improved disc and middle cultivators are used by nearly every planter. Stubble shavers and diggers have supplanted hoe labor in the stubble or rattoon crops of cane. Fertilizer distributers deposit the fertilizers upon both sides of the row at once. Improved listers or double-mold-board plows aid in reducing the cost of bedding land. Heavy double rollers compress the dirt on planted canes. Harrows of every kind are found in our fields. The cane cutter or harvester has not yet materialized, although a standing prize of $2500 by the Sugar-Planters' Association awaits the successful inventor.

Our factories are as near perfect as human ingenuity can construct. Immense crushers or shredders prepare the canes for ponderous six and nine-roller mills. Various and ingenious devices are used for transferring cane from carts to cars and from cars to the carriers, thus reducing the cost of handling cane enormously.

Filter presses of various patents filter the scums and juices in every sugar-house.

Superheaters are almost universally used. Crystallization in movement is practiced upon many plantations.

Improved sulphur machines furnish the sulphur dioxide to bleach the juices, which are concentrated to syrup and cooked to grain in vacuum by the exhaust steam of the engines and pumps. Many of our sugar-houses have a capacity of working up 1000 to 2500 tons of cane per day, and making out of it 500 to 1250 barrels of sugar.

Taking a retrospective view of the sugar-cane industry of the South for the last twenty years, it can truly be said that there is no industry in the world that has made such progress. The organization of the Sugar-Planters' Association in 1877 may be regarded as the starting point of the renaissance of the sugar industry. Since that time the sugar experiment station has been established, whose teachings and experiments have illuminated the field and factory. "The Louisiana Planter and Sugar Manufacturer" has had its birth in this period, and is now firmly established, visiting weekly the home of every planter, manager, overseer, sugarmaker, etc., carrying with it information upon every subject pertaining to the agriculture of sugar-cane and the chemistry and manufacture of sugar. The Sugar Exchange has been created in New Orleans, where the products of the plantation are quickly sold. Improved implements for the preparation and cultivation of the soil everywhere prevail. Improvement of soils, both by scientific rotation of crops, involving the nitrogen-gathering cowpea, and the extensive use of commercial fertilizers, whose purity and guarantee are sustained by chemical analyses made by official chemists without cost, are everywhere in evidence. Tonnage in the field and yield per ton in the sugar-house has largely increased, and the cost of growing the cane and of manufacturing it into sugar materially reduced.

Small sugar-houses are fast disappearing—yea, almost obliterated—and enormous factories with every modern labor and fuel saving apparatus are to be found in every section. Many factories have already introduced petroleum oil from Beaumont as fuel in place of coal, and all will follow the ensuing season. The output of sugar per acre and per ton has been greatly increased. New lands are being opened and old plantations better drained and cultivated.

In fact, "expansion" in the cultivation of sugar-cane in the South and of the sugar-beet in the West, and sugar factories in the "expansion," is the only kind favored by the sugar-planters of the South. Thousands of acres of land well adapted to the growth of sugar-cane are available in Louisiana, Texas and other Southern States. Capital alone is wanted to develop them and build the necessary factories, and this will come if our national legislature will give us permanent tariff laws protecting sugar.

Wm. C. Stubbs

RAILROADS AS A SOUTHERN GAUGE

By JOHN H. CONVERSE
Baldwin Locomotive Works, Philadelphia

Perhaps in no respect has the development of the South been more strongly indicated in the matter of its railways. Whilst some of the first railroads in the United States were constructed in the South, they were for years laid with light rails and operated with light, wood-burning locomotives. The gauge of the Southern railways was five feet, whilst that of most of the Northern lines was four feet eight and one-half inches. This made a break of gauge requiring expensive transfers and change of cars at most junction points between the Northern and Southern systems.

The change of gauge of the Southern lines so as to conform to that of the other railways of the United States was one of the most important and significant transactions in our railroad history. It made possible the organization and management of the through lines, expedited travel and transportation, and did much to bind together both sections of the country. Locomotives equal in power and weight to those of any of the trunk lines are to be found on the Southern railways. With the development of coal production, wood as fuel has disappeared, and today nearly all locomotives in the Southern States are coal-burners.

In no part of the country has the growth of industries been greater than in the South during the latter part of the nineteenth century. A region which once was supposed to be depended upon for only cotton and tobacco has now developed nearly every one of the great sources of material wealth. In the iron industry it easily dominates. The coal development has also been most marked. In the manufacture of cotton goods Southern factories are now competing closely with the New England mills. The recent oil production in Texas has added a new basis of prosperity. The future of the South under all these influences certainly is most promising.

John H. Converse

Realism of Southern Dreams of Material Progress

HINTS OF HALF-FORGOTTEN FACTS

By EDWARD INGLE

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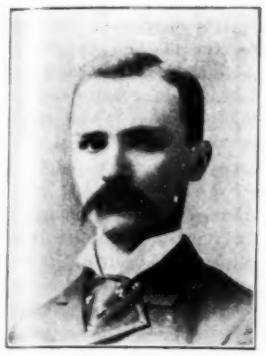
One of the most salient features of today's Southern progress in manufacturing, mining, railroading and commerce is its realization of dreams of Southern men of fifty and more years ago.

When the strivings of the fathers are recalled, when their records still surviving are scanned, when the lines of present achievements are followed back to their origins, the conviction is clear that the spirit of the South of 1902 is identically the spirit of the South of 1850 and earlier.



EDWARD INGLE.

Circumstances have changed. A great load has been lifted. Obstacles of many kinds which that load made almost insurmountable have disappeared. Ambitions and energies, no whit reduced in force, have been permitted to follow channels leading most directly to all that makes a country substantial and progressive. The South is well on its way to settlement in the Promised Land, viewed longingly, though vainly, from afar by the elders, who, unable to go forward, in spite of their courage, were given visions of the route and the inspiration to map them accurately for those that were to follow.

Reading after them, appreciating their hopes as revealed in speeches and writings, and studying their efforts and their accomplishment, one cannot fail to recognize in the farsightedness of their imagination, without which no notable advance may be made in any field, in their instinct to make their section mighty through a balancing of agriculture, industry and trade, and in their broadminded desire to place the South in the relation to the whole country and the civilized world justified by its wonderful stores of natural wealth, the unchanged characteristics of Southern workers, who are now winning success and bringing the attainments of their section into due proportion with those of other parts of the country.

The goal which the South began to leave behind at the turn of the century, girding up its loins and taking a long-drawn breath for swifter speed, was not easily reached. Near half a century passed before projects approached reality. To explain the hindrances, to give understandng of the drawbacks and to emphasize the persistence, if not continuity, of enterprising ideas in the South, a brief review of the economic manifestations of the earlier period, especially in regard to carefully-framed expressions of the sentiments of progress, with a summary of the present situation, may not be amiss.

EQUIPMENT AND PLANS FOR PROGRESS.

Neither in inventive genius, in mechanical skill nor in abundance of material for manufacturing; neither in ability to plan and to carry out large railroad undertakings, nor in appreciation of the value of home and foreign trade and in the knowledge of the best methods for promoting it, was the antebellum South lacking. At the dawn of the age of steam, while handicraft was still of more importance than machinery, except that of the simplest kind, and primitiveness in means of transportation and communication compelled men in widely-separated communities to live largely unto themselves and upon themselves, industrial productivity in this country was about equal in both the leading sections on the seaboard.

A region which could produce a man such as Thomas Jefferson, finding time in the midst of constructive statesmanship, of the elaboration of political principles which have powerfully influenced the course of world history, and of the cultivation of the fine arts and the study of meteorology, to invent an improved mold-board for plows; as Cyrus H. McCormick, with his pioneer reaping machines; as George G. Henry, the Mobile inventor of a machine for use upon plantations to make yarns direct from seed cotton; as the Georgians who suggested to Eli Whitney the idea of the saw gin, which, invented by him and practically applied in the invention of Hodgen Holmes of Georgia, revolutionized American industry and undoubtedly changed the course of American history, was hardly poverty-stricken as to the inventive spirit. Moreover, the record of more than 2900 patents granted Southerners during the first sixty years after the Revolution, though that number was less than one-fifth of the total number granted in the country during that period, and the facts that fifty-five years ago a Southerner looked for the birth of a typesetting machine capable of doing as much work with one man as a dozen men could do without it, and perceived that "this iron-headed and ..on-fingered compositor" would give the art of printing an expansion almost beyond conception, and that the device known as the "Virginia" in some quarters and as the "Merrimac" in others induced the radical changes in naval architecture and naval warfare, which have resulted in the modern floating fighting machines of steel, point to the kind of mind which improved from time to time the simple appliances for preparing cotton for the mill, and built and operated many industries connected with cotton, iron and lumber, which in their accomplishments before the war made a fair index of the South's potentialities as a manufacturer.

There was no ignorance about the general wealth of the South in minerals. The first bituminous coal mined in this country came from Chesterfield county, Virginia. The mines, which are within twenty miles of Richmond, were the only source of the fuel during the eighteenth century, and as late as 1848 more than 180,000 bushels of the coal were sent to Boston. In 1860 coal was mined in Maryland, Kentucky, Virginia, Georgia, Arkansas, Tennessee and Alabama. The coal of Arkansas was used for fuel by local blacksmiths and in households at Little Rock, and the fields had been traced before the middle of the century from a point forty miles above Little Rock, on the Arkansas river, and along both sides of that river far beyond the limits of the State. B. Lawrence, a geologist, estimated that its length within the State was more than 100 miles and that its width was from twenty to thirty miles, and he pointed out that the coal could be mined economically and with comparatively little danger. Though the South increased between 1840 and 1860 its output of coal by a little more than 209 per cent., its capabilities in that direction were by no means developed, and the complaint was made that in 1850 it was a matter of not less mortification than astonishment that Virginia, with an area of coal measures covering not less than 21,000 square miles, much of which lay on or near navigable rivers, and capable of yielding varieties equal in quality to British coal, should be reduced to the actual production of less than 200,000 tons, valued at $650,000, while Great Britain, with a little more than half the extent of coal measures, was producing annually 37,000,000 tons, valued at the mine at $37,000,000.

The State geologist of Alabama, M. Tuomey, in his first annual report, in 1850, noted that the first use of Alabama coal recorded was in 1834. He found the State rich in bituminous coal. The principal vein appeared first in the bed of the Black Warrior river, near Tuscaloosa, and extended across the State into Georgia, with its principal width forty miles in Shelby and Bibb counties. Blacksmiths in its neighborhood dug it for their forges, it was used in an iron foundry in Shelby county, was hauled from one point by wagon to Tuscaloosa, where it was used in private houses almost to the exclusion of wood, and was carried down the river on flatboats to Mobile, where it was sold at from $1 to $1.50 per ton, largely for household purposes, though the proprietors of the gas works there were quick to make use of it in the manufacture of gas. One of the most interesting facts of Professor Tuomey's report was the explanation of the rather spasmodic working of the coal deposits. He said that only three beds were worked underground, the rest of the coal being raised from the bed of the river, in which operations could be carried on only during the low stages of the water and in the leisure of nearby farmers, who were the principal proprietors. Navigation of the Warrior river terminated at the coal beds, which formed the obstruction in its bed. It cost about four cents a bushel to boat the coal to Tuscaloosa, a distance of fifty miles, and an additional four cents from Tuscaloosa to Mobile.

Professor Tuomey described also the occurrences of marbles, manganese, pure sulphuret of lead, red ochre and other minerals, and mentioned at some detail the Benton Iron Works, in Benton county, which had been in successful operation for several years, and which at the time was contemplating the introduction of hot blast and other improvements. One of the proprietors wrote him as follows:

"We have a blast furnace, a puddling furnace and forge in operation. We turn out daily about 6000 pounds, 2000 pounds of which are put into hardware and machinery castings, 2000 pounds into bar iron and 2000 pounds into pigs. We use 600 bushels of charcoal every twenty-four hours. Our iron-ore beds (some of them) are within 600 yards of the furnace. Our limestone is at the furnace, and in abundance. The nearest stone-coal beds that have been worked are thirteen miles off. We are now preparing to put up a rolling mill, and think that in a short time we shall be able to roll iron successfully. Our establishment is five miles east of the Coosa river, opposite the Ten Islands, and eleven miles from Greensport. We ship our iron down the Coosa in flatboats to Wetumpka, Montgomery and Mobile. We have found the articles we produce here of a ready sale in either of those markets. We are prepared to make, turn off and fit up all kinds of machinery except fine castings for cotton mills, and will be very soon ready to furnish these."

The reference in this letter to the close association of iron ore, limestone and coal closely resembles accounts of the advantages of the modern site of the Alabama iron industry, and the general description of the operations of the work applies to the great majority of such undertakings in the country at that time, many of which, dating from colonial times and recalling the pioneer work of Governor Spotswood at Germanna, in Virginia, were carried on in most of the Southern States between Maryland and Alabama upon rather a primitive basis, dealing in comparatively small quantities of material and using charcoal mainly for fuel. With the later drift of the iron industry toward the Great Lakes the great majority of these charcoal furnaces passed out of existence, though many of them in the South were in operation at the outbreak of the war, and one of them in Maryland is still using charcoal in smelting the same grade of ore as that first mined in Maryland in 1649. In 1850 Maryland ranked third of the States of the country in the value of pig-iron produced, and Virginia third in the number of establishments making it, while ten years later Virginia made nearly as much wrought iron as Massachusetts.

Quincy granite was brought to South Carolina, but not because the existence of building marble in the Carolinas, in Tennessee and in Georgia was unknown, and there were tentative exploitations of the minerals in other States. But they were only tentative, and, while the presence of petroleum in abundance in Texas was known, one of the problems discussed in the later fifties was the

effect upon the price of cottonseed oil of the discovery of petroleum in Pennsylvania.

This suggestion was made by Charles Cist of Cincinnati, who wrote voluminously during the fifties in encouragement of the cottonseed-oil industry. He said: "I put cottonseed oil at sixty cents, although lard oil and coal oil, at present its only competitors, command an average of eighty cents per gallon, because the recent working of oil wells in Pennsylvania may reduce the price of cottonseed oil, which is at present eighty cents. But I am by no means certain that the Pennsylvania oil will at all interfere with this article, being greatly inferior to most of the properties for which oil is valuable." Cotton oil had been manufactured in Mississippi as early as 1834, and subsequently a mill had been built near Mobile, but had been discontinued. A machine was invented by Smith & Follen of Petersburg, Va., for hulling and cracking cottonseed, mashing the kernels in a horsehair envelope until the oil was driven out. This oil was used for cooking and painting, and belief was expressed that there was a fortune to be derived from using it in soapmaking, while the oilcake would make excellent food for stock. But the discovery of the value of cottonseed oil and the promise of its wide use was not received everywhere with pleasure, one objector making the point that "if the seed be no longer returned to the land, but is otherwise consumed, the impoverishing process will go on with about tenfold rapidity."

There were many suggestions about the possibilities of the oil. Dr. Edward Jenner Coxe, writing in the New Orleans Daily Delta in 1854, estimated that the waste of cottonseed at the time amounted to $38,000,000 annually, and he pointed out that the oil might be used as a substitute for olive oil and in making soap and candles. There was at that time in New Orleans a cotton-oil factory run by Wilbur & Co., which had been granted a medal for its product in October, 1853, at the exhibition of the American Institute. A little later Edgar Conkling of Cincinnati estimated that the value of the cottonseed, of the fiber, of the oil for burning, lubricating, and, perhaps, for painting and for making soaps, and of the refuse cake for distilling and hog-feeding, as equal annually to that of the cotton crop, and he said that a railroad office in his city was lighted by gas made from cottonseed cake. Mr. Cist, writing in 1859, said that within two or three years William R. Fee of Cincinnati had constructed a cottonseed huller, and that hullers were in operation in New Orleans and St. Louis, and were about to be put in operation at Memphis, Cincinnati and Dayton, and in Texas. He regarded the oil as equal to olive oil, and as good also for lubricating and burning, and the cake as good food for cattle, and he calculated that the value of oil from a 3,600,000-bale crop of cotton would be $87,120,000; of the cake, $19,057,500—a total of $106,177,500.

Though Southern iron entered into the manufacture of agricultural implements, firearms, locomotives and cars, cotton gins and other machinery, the iron-making industry did not keep pace with cotton manufacture. The latter was naturally the industry to which the South turned when the manufacturing plans were discussed. In the beginning it was close upon the heels of New England, a spinning mill established in 1813 in North Carolina having its machinery built on the premises, and the machinery for the first steam mill in the same State being brought by water from Philadelphia to Fayetteville, and thence across country in wagons to Greensboro. But in the first forty or forty-five years of the century the progress was slow. Between 1844 and 1850, however, the consumption of bales by Southern mills increased from 66,000 to 107,615, nearly one-fifth of the whole number used in the country, and many of the establishments, being equipped with improved machinery, and producing, for other reasons, at better advantage, were beginning to cause alarm in the long-established centers of New England. In the twenty years before the war the capital invested in the Southern textile industry more than doubled, and the value of its products nearly trebled. Most of the factories were small and occupied with primary movements, about one-third of all the yarn made in the country being spun in the South, but cloths and other goods were made, not in sufficient quantities, however, to meet the South's demand, despite the fact that the hand manufacture of clothing was maintained by individuals in isolated neighborhoods and upon some of the plantations.

The outlook of the cotton-manufacturing business and the benefits to be conferred by it upon the South were usually the burden of much of the talking and writing about Southern industry, and not a few of the arguments dealt with the importance of the rising generation's turning its attention to that field or with the importance of manufacturing in the abstract. Thus, Mr. James L. Orr of South Carolina, in a plea for factories and machine shops, expresses gratification at the fact that young men in the State were commencing to realize that labor was reputable, and he added: "When the graduates of a respectable institution sacrifice false sentiment and go to the machine shop to be educated in mechanism and enginery, as some have recently done, it furnishes the index of a healthful public opinion and gives bright prospects of an increasing prosperity in the future." So Governor Hammond of the same State, in an address before the South Carolina Agricultural and Mechanical Institute, felt obliged to controvert objections that the mechanic arts dealt extensively in minute details, and therefore were to be avoided; that where manufactures and commerce flourished morals were corrupted and free institutions did not prosper, and that because renowned men and nations of antiquity had contempt for manufactures, trade, commerce and mechanic arts, their example should be followed. At the same time, though, he called attention to the decaying prosperity of South Carolina, pointed out the reasons for it, and said: "We must take a wider range and introduce additional pursuits that will enlist a broader interest, that will absorb all our redundant capital and awaken all the intellect and energy now dormant in our State. If we look around us we shall see that those nations only are powerful and wealthy which, in addition to agriculture, devote themselves to commerce and manufactures, and that their wealth and strength are nearly in exact proportion with the extent to which they succeed in carrying altogether these three great branches of human industry. The Institute whose anniversary we have met to celebrate was founded in part for the purpose of assisting to lift the mechanic arts from the low condition they have hitherto occupied in South Carolina and the South, and to stimulate our people to avail themselves of the manufacturing and commercial resources they possess. These resources are little known and less appreciated, but it is demonstrable that our Southern States possess natural advantages which enable them to compete successfully with any other in manufacturing the principal articles now required for the necessities, the comfort and the luxury of man, while with our abundant materials for shipbuilding, our noble bays and rivers and our shore-line of 20,000 miles of seacoast, we have only to make the attempt to obtain beyond rivalry the entire command of at least our own commerce."

Governor Hammond was of the opinion that the greater portion of the capital and enterprise which might be embarked in industry would be absorbed in cotton manufacturing, and after an elaborate survey of the opportunities in that line, he said: "There seems, then, to be no impediment whatever to our embarking at once in the manufacture of our cotton, and to the full extent of consuming our entire crop, in competition with the world. We have at hand and within our grasp all the elements necessary for erecting and carrying on manufacturing establishments, and we have the raw material on the spot and at a cost one-third below our European and one-eighth below what our Northern rivals are compelled to pay for it, and we have it, also, in far better condition. When it reaches our factories it will not have been compressed, often not put in bales; it will not have been drenched in rains and rolled in the mud of wharves, nor bleached and rotted by exposure in its long travels by land and sea. It must, therefore, necessarily, make smoother, stronger and more durable fabrics of all descriptions here than can be made of it elsewhere. And this is fully exemplified by the fact that both the factory in this city and that at Graniteville have, in the very first year of their operations, carried off the highest prizes at Northern exhibitions."

The speaker was half-prophetic in the light of current tendencies when he said: "But it is strenuously contended that the introduction of manufactures in the South would undermine our free-trade principles and destroy the last hope of the great agricultural interest. It is susceptible of demonstration that the consequences would necessarily be precisely the reverse. The manufacturing people of the North desire a high tariff for no other purpose but to compel the non-manufacturing people of the South to buy from them in preference to strangers. If the South manufactures for itself, the game is completely blocked. We will, of course, use the productions of our own looms and workshops in preference to any others, and the North will then clamor, as the English manufacturers are now clamoring, for entire free trade, that they may exchange their industrial products on the most favorable terms with foreign nations. This result is as inevitable as it is obvious."

The allusion to Graniteville by Governor Hammond directs the mind to the work at that place of the Virginian-born William Gregg, who, beginning active life as a watchmaker, became a leader in Southern industry and lived almost long enough to witness its revival on healthy lines. His factory at Graniteville, which was a model of its kind both as to the character of its work and as to the advantage given by it to a large class of whites, was a success from its beginning, in 1847, the net earnings of the company operating it being 8 per cent. in 1852, 11½ per cent. in 1853 and 18 per cent. in 1854. Before he founded this factory Mr. Gregg, in a series of articles published in a Charleston newspaper, afterwards reproduced in pamphlet form, and more recently as a timely appendix to D. A. Tompkins' "Cotton-Mill Commercial Features," carried on a vigorous campaign for factories. He was especially earnest in his endeavor to overcome the prejudice against the use of a steam engine in Charleston, but gave a great deal of advice, which, had it been regarded properly and effectively, would have hastened the fulfillment of some of his forecasts and rendered others null and void.

He urged the erection of steam mills in Charleston for the manufacture of thousands of articles at that time imported in the State, of steam cotton factories to employ the poor and needy of the city and the hundreds "who seem to have little else to do than to follow military parades," and in the country to employ "our poor and half-starved population, whose condition could not but be improved in working up a part of our cotton into cloth," a tannery, and the establishment of a blacksmith, a shoemaker, a clothier, a hatter, a wagonmaker and a carriagemaker at every crossroad. For he said: "Let the ball be set in motion; then will our miserably poor white population at once rise from their ignorance and degredation, and we shall no longer hear the complaint that planting capital will pay no more than 3 per cent."

Mr. Gregg had made a first-hand study of conditions in New England resulting from the readiness of the people there to adapt themselves to varying circumstances. He explained the failures of manufacturing enterprises in the South and used the following vigorous language:

"Those who are disposed to agitate the State and prepare the minds of the people for resisting the laws of Congress, and particularly those who look for so direful a calamity as the dissolution of our Union, should, above all others, be most anxious so to diversify the industrial pursuits of South Carolina as to render her independent of all other countries, for as sure as this greatest of calamities befalls us, we shall find the same causes that produced it making enemies of the nations which are at present the best customers for our agricultural productions.

"There is no good reason why the name of some of our large planters should not be seen on bales of yarn making their way to Europe to supply the markets that are now monopolized by the English spinner. England has for years been sending millions of dollars' worth of this article to the Continent. Since 1832 she has exported to that part of the world from $16,000,000 to $25,000,000 worth per annum. And what is to prevent us in Carolina from setting up a claim to a portion of this trade? Are we afraid of Northern competition in this the simplest of all kinds of manufacture? The South has never failed to supplant the North in this branch of manufactures whenever the attempt has been made.

"My recent visit to the Northern States has fully satisfied me that the true secret of our difficulties lies in the laziness on the part of those who ought to labor. We need never look for thrift while we permit our immense timber forests, granite quarries and mines to lie idle, and supply ourselves with hewn granite, pine boards, laths and shingles, etc., furnished by the lazy dogs of the

North—ah, worse than this, we see our back-country farmers, many of whom are too lazy to mend a broken gate or repair the fences to protect their crops from the neighboring stock, actually supplied with their axe, hoe and broom handles, pitchforks, rakes, etc., by the indolent mountaineers of New Hampshire and Massachusetts.

"Limited as our manufactures are in South Carolina, we can now more than supply the State with coarse cotton fabrics. * * * We can most assuredly make our own axe-handles, raise our own cabbages, beets, potatoes and onions; our boys, as in olden times, may be taught to make their own toy wagons and wheelbarrows; our wives and sisters can hem our handkerchiefs and bake our bread. * * * Pardon me for repeating the call on South Carolina to go to work. God speed the day when her politicians will be exhorting the people to domestic industry instead of State resistance; when our Clay clubs and Democratic associations will be turned into societies for the advancement of scientific agriculture and the promotion of mechanic arts; when our capitalists will be found following the example of Boston and other Northern cities in making such investments of their capital as will give employment to the poor and make them producers instead of burthensome consumers; when our city council may become so enlightened as to see the propriety of following the example of every other city in the civilized world in removing the restrictions on the use of the steam engine, now indispensable in every department of manufacturing. * * * God speed the day when our State may contain hundreds of such men as Mr. Simmons of Rhode Island, who manufactures as large a quantity of cotton as is produced on General McDuffie's plantation in South Carolina, on which Mr. Simmons realizes a larger profit than falls to the lot of General McDuffie."

Referring to General McDuffie's earlier enterprise in cotton manufacturing, Mr. Gregg wrote: "Why did you not follow the patriotic example of the Lowells, Bootts, Jacksons, Appletons and Lawrences of Boston, who, after fighting for years with their native State against the protective system, and finding it fastened upon her, did not stop to preach the doctrine of State resistance, but at once withdrew their capital from the channels of commerce, which had hitherto yielded them princely fortunes, and commenced cutting their way into the forests of Massachusetts, damming up rivers, digging canals and erecting manufacturing establishments, which have yielded to their country tenfold the capital invested in them." He concluded as follows: "The time is not far distant when these United States shall manufacture greatly more than they can consume, and compete with the whole world for other markets. Then will the tables be turned and the day of retribution come; when the manufacturers of this country shall be competing with each other for the home market, and we shall be supplied at prices far below what we should have been without the American manufacturer. The Southern States could not take a more effectual step to bring about this state of things than by commencing the manufacture of coarse cotton fabrics, which by right belongs to them, and which they will get with the first effort made to obtain it. They will at once drive the Eastern mills now engaged in this business to the manufacture of fine goods. The immense works already in operation and the millions of capital engaged in manufactures would still continue to be engaged in them. For a trfling expense any of those Massachusetts mills may be so altered as to run on the finest cotton fabrics, and the disposition to change from coarse to fine goods exists with all manufacturers, so that it will require no great effort to drive the coarse spinners from their present occupation to compete with their neighbors in the making of fine fabrics. Finally, when we shall have put a stop to the draughts which the Southwestern States are continually making upon us, and shall have invested our capital in the business of manufacturing our raw material into yarn and coarse fabrics, making a mutual exchange with our Northern brethren of the coarser for the finer goods, then we shall find the tariff no longer a subject to quarrel about, but we shall dwell in peace and harmony, and shall rejoice in the blessings which this system of domestic industry will confer on South Carolina."

Over in Alabama was a man, born in New Hampshire, but after he had served his apprenticeship to the carpenter's trade, indentified thoroughly with Southern industry. Daniel Pratt, the founder of the industrial hive at Prattville and a leader in the manufacture of cotton gins, was deemed of so great value to the State that its university made him in 1846 an honorary Master in the Mechanic and Useful Arts. He did things, and at the same time preached the practical gospel of work, taking as his text that the encouragement of local tailors, shoemakers, tanners, saddlers, cabinetmakers, pailmakers, broommakers and of cotton and woolen factories was a better procedure than angry debates in conventions for the protection of the State. In that advice he was in line with Mr. Gregg, while a complement to the Charlestonian's views on the tariff in relation to Southern industry was had in the words of Mr. James Robb of New Orleans in 1852. He said: "After the war of 1812 the manufactories of the North were found in such a condition as to need the protection of the government. That protection has been kept up ever since, until it has built up at the North a vast manufacturing power and population. The generosity of the South has fostered an interest which has now become an overwhelming one. In the meantime we have done nothing toward fostering industry in our mills. The example of the North has been lost upon us. We have neglected the means by which she has grown great. * * * Let us follow the steps by which she has reached her present greatness. When we embark in like enterprises we shall show a like degree of prosperity and power."

For Florida, where live oak and other wood from South Carolina were used at Key West in building small vessels, where the manufacture of arrowroot starch had become an established business at Miami, and where sugar manufacture was increasing, with lumber mills at Pensacola and Jacksonville, and where turpentine-making in the western part of the State had profits large enough to draw off attention from cotton culture, the growing of sisal hemp and the utilization of great stretches of pine timber in industry were urged, along with statements that the soil produced every delicacy of vegetables and many fruits, including oranges and lemons, throughout the year.

In the Augusta canal Georgia had already begun to make use of her immense water-powers, which George White estimated were sufficient to manufacture all the cotton grown in the world or to grind all the grain produced in the United States. The text was made that "Georgia must appropriate her own improvements to the building up and enriching her own people," and Alexander H. Stephens, speaking in Congress of the potentialities of his State, said: "Georgia, too, has her beds of coal and iron, her lime, gypsum and marl, her quarries of granite and marble. She has inexhaustible treasures of minerals, including gold, the most precious of metals. She has a soil and climate suitable for the growth and comfort of almost every product known to husbandry and agriculture. Her yarns are already finding their way to the markets of the North and foreign countries. * * * She has also her flour mills and paper mills; her forges, foundries and furnaces, not with their fires extinguished, as the gentleman from Pennsylvania said of some in his State, but in full blast."

Virginia was by no means satisfied with its tobacco factories, its flouring mills which sent great cargoes to Brazil, its cotton mills making shirtings, sheetings and osnaburgs, its woolen factories and its iron works, one of which was awarded the contract for the construction of the engines for two government ocean-going steamers, because it had satisfied the government that its offer in competition with others was for cheapness and results the best, but the convention which expressed mortification at the inadequacy of the exploitation of the State's coal fields had this to say about another of its minerals:

"In regard to the iron trade, while Virginia has an unlimited supply of the finest ores, easily accessible for use and transportation, with the greatest abundance of coal, wood and limestone for their manufacture, yet, under the operation of the present revenue laws of the country, her production, in spite of all the efforts of the State to encourage it, has shrunk to an almost inconsiderable amount, and is in danger of utter ruin. The imports of British iron during the last year were about 320,000 tons, requiring for its manufacture nearly 1,500,000 tons of coal, more than 1,000,000 tons of ore and about 400,000 tons of limestone. All this, and more than all this, Virginia could easily have furnished, and to that extent have developed her mineral wealth and encouraged her industry, and yet she has hitherto been content to leave Great Britain the profits of its production, although the duty paid by Virginia on the imported product would have been equal to 5 per cent.—95 per cent. of the whole import being made north of Mason and Dixon's line and there confined."

It will be observed that the strongest agitation for manufactures was in the older of the Southern States, where agriculture, under the existing system, was at a disadvantage compared with that of the Gulf States and the Southwest. But even in the newly-settled regions there were industrial aspirations. Within a few years after the admission of Texas to the Union a substantial stone building had been erected within two or three miles of San Antonio and the machinery had been installed for the manufacture of wool into jeans, kerseys, blankets, satinets, etc.; sugar-making was under full headway, and attention was being directed to the State's stretches of forests of live-oak and cedar, pine and oak, ash and walnut, hickory and pecan, mulberry and cedar, cypress and other trees, to the unrivaled fertility of the soil in the production of a vast range of crops, and to the deposits of gold, silver, iron, coal, salt, lime, sandstones, lead, copper, alum, soda and potash and other minerals. But the efforts to develop, through manufactures, that portion of the South stretching from the Tombigbee to the Rio Grande were rather premature, in spite of logical arguments to support them, such as the calculation that the capital and labor expended by the Southwest in the transportation of its cotton and the return of the manufactured articles for consumption would in twenty years amount to a sum sufficient to erect buildings, purchase machinery and to put into successful operation mills capable of manufacturing all the cotton grown in that section; that the introduction of such manufactures would increase the demand for iron and its products, and would afford an immediate market for agricultural products of a perishable nature; that the moral and material condition of the people would be improved, the diversification of employments adding to the means of human comfort, in which all classes would share, and that the value of exports would be greatly enlarged.

Very early in this era of industrial revival in the South it was felt that the means of transportation should be improved. As James D. B. De Bow expressed it in a speech to the citizens of Nashville, Tenn., "God may have given you coal and iron sufficient to work the spindles and navies of the world, but they will sleep in your everlasting hills until the trumpet of Gabriel shall sound unless you can do something better than build turnpikes. You may have granaries sufficiently stocked to feed mankind, but mankind will starve and perish before a bushel of grain can reach them." Those words were uttered twenty-three years after subscription books had been opened for stock in a company planned to carry out the idea of Stephen Elliott for a railroad connecting Charleston and the West, and meeting the conception of the same period of Gen. Leslie Coombs, the first man, it is claimed, to propose a railroad in the Mississippi valley. The company interested in the Charleston road constructed an experimental railway five miles long, upon which the cars were operated by sails, and by 1832 the road itself was completed and in use for sixty-two miles. It was for this road that the "Best Friend," said to be the first locomotive built entirely in this country, was purchased, and the road itself for awhile was the longest in the United States. The Baltimore & Ohio, an earlier corporation, had overcome the difficulties of the Alleghanies by 1853, and in the meantime the total railroad mileage in operation in the South had increased to 2679—more than a quarter of the total mileage in the country, Georgia leading with 754 miles, and with 3229 more miles under construction.

This progress was largely due to the practical interest shown by the several States in railroad construction and by municipal subscriptions to such undertakings, while in some cases planters paid for their stock through the work of their servants in building the roadbed. Virginia invested in this way at least $8,000,000, Georgia $3,500,000, Maryland more than $5,000,000, Louisiana more than $1,600,000, and Tennessee, North Carolina and South Carolina were especially liberal, the governor of the last-named State, for example, advising, in 1853, that an appropriation of $1,000,000 in railroads in the State would be a wise expenditure, even if the stock of the roads never paid a dollar dividend, while the governor of Texas suggested that the State should subscribe to one-

half of the capital stock of the roads, should devote the proceeds of sales of public lands to the construction of roads, to be owned by the State, or should buy the necessary iron for them, taking a mortgage on the whole property as security.

What had already been done in this direction was set forth in elaborate detail, with a notable manifestation of the appreciation of the benefits of railroads, at the great Southern and Western railroad convention held at New Orleans in January, 1852, at which were present between 600 and 800 delegates from Virginia, Kentucky, Tennessee, Alabama, Florida, Mississippi, Louisiana, Arkansas, Georgia and Texas. This convention reviewed carefully the situation and suggested practical routes of construction, which, when completed, would have given the South all the railroad facilities needed. Comparisons were made of railroad progress in the North and in the South and in leading States of the latter section, arguments were advanced showing the beneficial effects of railroads upon the population, upon industry and upon wealth, backed up by telling facts, and it was resolved that the system of internal communication by railroads was of such importance as to justify and require a liberal application of the resources of the States interested in these works, inasmuch as the voluntary subscriptions of private individuals were inadequate to the purpose, and that public lands in the States should be appropriated to aid in railroad construction, while the people of municipalities and other political communities ought to be authorized to subscribe to stock. A special committee, of which W. M. Burwell of Virginia was chairman, presented a scheme of routes which is worthy of reproduction in part as indicating the broad scope of the views held at the time regarding the completion of systems which it has required fifty years to bring about. A striking feature of the scheme, which was based, to be sure, in some measure upon undertakings then under way, is the virtual coincidence between projects then advocated and certain railroad lines of today. The plans included:

A national road to the Pacific ocean, with one terminus on the Mississippi river north of the Ohio and another terminus south of it.

The Southwestern National Railroad, from Washington city to New Orleans, and passing through Virginia, Tennessee, Alabama, Mississippi and Louisiana, "constituting the shortest practical route of mail and transit," and including within it the Richmond & Lynchburg Railroad, the Virginia & Tennessee road, the Georgia & Alabama road, the Alabama & Tennessee River road, the Selma & Jackson road and the New Orleans & Jackson road.

For several of the States where construction had been comparatively slow the following roads were mentioned:

Kentucky.—The Memphis & Louisville and the Louisville & Nashville.

Tennessee.—The Memphis & Louisville, the Memphis & Charleston, the Louisville & Nashville, the Nashville & Southwestern.

Alabama.—The Mobile & Ohio.

Georgia and Florida.—The Florida Peninsula and the Gulf road, or a continuation of the Southwestern Road of Georgia to Pensacola bay.

Mississippi.—The Mobile & Ohio, the New Orleans, Jackson & Nashville, the New Orleans, Holly Springs & Ohio, the Vicksburg & Jackson extended by way of Brandon eastward to Selma.

Louisiana.—The New Orleans, Algiers, Texas & El Paso, the Madisonville & Jackson, the Vicksburg & Shreveport and the New Orleans & Nashville.

Arkansas.—The Arkansas & Mississippi River, from Fort Smith or Van Buren to Little Rock, and thence to White River, diverging there to Memphis and Helena; a road from Fayetteville to Van Buren; one from the St. Francis ridge, on the Central Railroad, through Jackson and Independence counties into Southwestern Missouri; one from Little Rock to the Louisiana line, connecting with the New Orleans & Opelousas, and one from Northeastern Texas to Little Rock, crossing the Red river at or near Fulton.

Texas.—A road from the northeastern part of the State, running on the dividing ridge of the Sulphur and Red rivers to the ridge between Bois D'Arc and Sulphur; thence to Dallas to connect with the New Orleans and El Paso route, and another continuing the New Orleans and Opelousas and the El Paso through Texas.

All of these were commended to the patriotic consideration of the legislatures and the citizens of the Southwestern States, a suggestion similar to that of the Charleston convention of 1854, calling for pecuniary aid by the several States for the encouragement of railroads, and to the joint resolutions of the legislatures of Mississippi, Alabama and Louisiana, instructing the senators from those States and their representatives to obtain donations of public lands within the States on the line of the proposed Ponchartrain Railroad, between Mobile and New Orleans, for the benefit of that enterprise.

Paralleling the conventions called especially to promote railroad building and extension were the commercial conventions, intended to arouse interests in the expansion of internal and foreign trade. The pace for these was set as early as 1837-1839 at Augusta, Macon and Charleston, which produced from such men as Robert Y. Hayne, George McDuffie and F. H. Elmore comprehensive addresses to the people of the South upon the importance of developing direct trade with the continent of Europe, with South America and with other lands, of improving Southern harbors and strengthening the lines of intercommunication among the States. At that time conservative estimates were that while the South was producing three-quarters of the domestic exports of the Union, it was sending a smaller proportion of those products through its own ports, and receiving much less of the merchandise imported in exchange. The rise of North Atlantic cities as a consequence of developing their trade instincts in acting as middlemen not only for their own section and the West, but also for the South, was compared with the decline of South Atlantic ports from their position of superiority in this respect at the close of the eighteenth century, and the importance of internal improvements, of greater liberality of capital toward commercial undertakings and of the establishment of regular lines of steamers and packet ships was strongly urged. It was thoroughly understood that the commercial cities of the South Atlantic and of the Gulf were the natural marts of the people of the West for obtaining their supplies of foreign merchandise, and it was argued that as they already found a market in such cities for the principal part of their own staple productions, it would be decidedly to their interest to obtain, by direct exchange, their foreign merchandise at the same places, and avoid the complicated and expensive operations of the time required in dealing with Eastern cities.

Comparatively little effect was wrought by these convention of the thirties, but their animus was manifest in the convention at Memphis in 1845, over which John C. Calhoun presided, and in which sixteen Southern and Western States were represented by 600 delegates. In some quarters there was apprehension that the convention involved a political scheme, and in others considerable anxiety existed as to the attitude which Mr. Calhoun might assume. In his opening address he dwelt principally upon the relations of the general government to internal improvements, but he did not extend his objections to a connection between the two in the improvement of the Mississippi river. He took the ground that the Mississippi, which was the great highway of Western commerce, was to be regarded as a great inland sea, and therefore as much susceptible to the care of the general government for its improvement and defence as was the Atlantic coast. At the time this assertion had something of a sensation about it, and the comment of one of the secretaries of the convention regarding this rather dramatic incident in Mr. Calhoun's wonderful career is interesting. He wrote:

"It was considered that his own peculiar views must either be compromised or come into direct collision with all around him. We well remember the anxiety and the solicitude of his friends upon that occasion. We shall never forget the deep burst of approbation and applause which rung through the hall when he made from his seat the remarkable and unexpected declaration that the Mississippi and its great tributaries were to be regarded as an 'internal sea,' and as much entitled to the protection and care of the federal government as the Atlantic coast. The effect was electrical. In many places it was stated confidently that Mr. Calhoun had struck his flag and gone over to the side of internal improvement, though he disclaimed anything of the kind. In South Carolina so intense was the feeling, and so evident the fear of defection, that, though re-elected by the legislature, then in session, to the Senate, Mr. Calhoun's course was much and strongly animadverted upon. A strong disposition was even evinced to pass resolutions which, under the circumstances, would have been equivalent to instructions—a course of conduct contrary to the general policy and doctrines of the State, evinced in its refusal to instruct a senator several years ago when he was clearly misrepresenting her."

The convention advocated the improvement and preservation, by the appropriation of money by the general government, of the navigation of the Mississippi and the Ohio rivers and their principal tributaries as indispensable to the defence of the country and essential to its commerce, the deepening of the mouth of the Mississippi at the cost of the nation, the building of steamers for the navy in Western waters, enlightened consideration by Congress of the plan for connecting by a ship canal the Mississippi river and the Great Lakes, the establishment of ample military and naval defences and of additional lighthouses along the coast of the Gulf, and of a national foundry and armory at some point on the Western waters, the construction of marine hospitals in the South and West, improvement of the mail service in those sections, the extension by government of the magnetic telegraph through the Mississippi valley, the reclamation of public lands along the Mississippi by the throwing up of embankments, State aid to railroad-building, and similar aid from the national government by granting rights of way and alternate sections of public lands, the improvement of the approaches to St. Louis, the completion of the military road from the west bank of the Mississippi opposite Memphis into the highlands of Arkansas, and the establishment of a government dry-dock on the Gulf coast.

Differing little in character from these resolutions were those of subsequent conventions, which, by 1852, became annual affairs, meeting at Baltimore, Memphis, Charleston, New Orleans, Richmond, Savannah, Knoxville, Montgomery and Vicksburg, until, with lessening numbers in attendance and with lessening influence, they had come under the dominance of politicians advocating, and advocating persistently and emphatically, a reopening of the African slave trade, a scheme as foolhardy, from the political, economic, social and moral standpoints, as it was inane. New ideas, however, were added from time to time, such as those of government aid in digging a ship canal across Florida, deepening and fortifying Southern harbors and establishing a navy-yard at New Orleans, extending aid, through mail contracts, to the Tehuantepec Railroad Co., while the States were asked to encourage their boys to go to sea, to bestow bounties for direct importations, to organize quarantines and to encourage local shipbuilding and railroad construction. The cause of Southern education and of Southern text-books was not forgotten, and the speeches of the time were quite similar in strain to those made nowadays at regular intervals.

Probably the most practical and possible projects to which most attention was given were those relating to the piercing by a waterway of the Central American isthmus and to the development of direct communication between Southern ports and foreign countries.

Eighty-three years ago the first steamship to cross the Atlantic sailed from Savannah as a venture of Southern men. Its looming on the other side was enough to startle the inhabitants of the British Isles and the Continent. But its real significance existed in its prophecy of American commerce and the part which the South was to play in it. Fulfillment was long deferred. More immediate conditions were marked out in the arrival, in 1838, of two steam packets from Great Britain, not at a Southern port, but at New York. The commercial scepter had long since been departing from the South, and illustrative of the part that section was to play in foreign trade for more than thirty years had been the fact that Boston exported in 1810 $911,241 worth of cotton, $214,718 of rice, $169,250 of tobacco and $70,084 of naval stores. In 1835, though, about 45 per cent. of the commerce of the United States was handled at Southern ports. But by 1859 the South's share in this business had declined to about 38 per cent., though its contributions of material to commerce were a greater percentage of the whole.

This decadence was an influential element in stirring Southerners to agitation for Southern-built, Southern-owned and Southern-manned vessels, with

regular sailings from Southern ports, which found expression in resolutions of conventions recommending State and municipal aid to home-built ships, in the provision by the Louisiana legislature for a bonus of $5 a ton for every vessel of more than 100 tons burden built in the State, in the act of the Alabama legislature exempting from taxation the sale of all goods directly imported into the State, recalling an earlier provision in South Carolina, exempting from State taxation upon their sale by the original importer of goods imported in vessels owned in South Carolina, which Mr. John Forsyth, in a speech before the Franklin Society of Mobile in 1854, said "operated as a check to the unnatural and roundabout current of trade by giving to the Charleston importing merchants an exemption from the local burdens (at the expense of the State treasury) which those must bear who do not import in vessels owned by that State." The commercial convention at Baltimore in 1852, at which were present representatives from all the Southern States except Texas and Arkansas, recommended the establishment of a line of steamers between Baltimore and Liverpool and the fostering by the United States government of steamship connections between the South and the Amazon. The body at Richmond, composed largely of Virginians, asked Southern senators and representatives to vote for no law granting appropriations in aid of ocean mail lines terminating at any Northern port without the insertion of a clause binding the government to extend like aid to a line or lines that might thereafter be established between Southern and foreign ports. Congress was urged by the Charleston convention to encourage the establishment of mail steamships between Southern ports and Brazil and Europe, while at the Memphis convention, a year earlier, at which between 400 and 500 delegates were present, President W. C. Dawson, in his address, had contended that to secure better foreign mail facilities, which, of course, meant better commercial facilities, the South and West should ask from the general government the same aid as that which had been granted commercial companies in Northern ports. There was a ring of commercial expansion in the resolution favoring the free navigation of the Amazon in the sentence, "The interests of commerce, the cause of civilization and the mandates of High Heaven require the Atlantic slopes of South America to be subdued and replenished." Upon the same occasion the Cuban question, which now and then came to the surface, received some attention in consideration of a resolution calling for the acquisition of Cuba for the purpose of securing "protection of the great and growing commerce" of the United States. This, however, was laid on the table and finally defeated, plans of that day against Cuba, whether of a filibustering or other character, not receiving unanimous support in the South, especially in Louisiana, with its sugar-growing interests.

At the Charleston convention the negotiation by the United States of treaties of reciprocity was advocated by Lieut. Matthew F. Maury, who was head and shoulders above many of the Southern leaders for material ends, in the vast store of practical knowledge which he possessed, in his versatility and his actual attainments. Years before he had contributed, as "Harry Bluff," to a Southern magazine a series of papers bearing in spicy manner upon conditions in the navy, which was strongly influential in the establishment of the Naval Academy. He developed to permanency the Naval Observatory. He suggested the stretching of the Atlantic cable along the ocean bed, and won his title of the "Pathfinder of the Seas" in his authorship of "Wind and Current Charts" and "Sailing Directions." His investigations of the winds at sea impressed him with the idea that as much might be done for agricultural and sanitary meteorology as had been done for that of the sea. His plan was that farmers and planters should lend that sort of co-operation on the land that the merchants and sailors had given at sea, and alluding to an office in the War Department in which the work could center, said that the government should do its part by having the observations thus procured discussed and published. In a letter of 1855 he elaborated the idea from which has grown the United States Weather Bureau, of incalculable benefit to commerce, as follows:

"There are truth-loving, knowledge-seeking men in every country, in every State, who would be glad to co-operate in such a plan. They would readily undertake to make the requisite observations if they were furnished with the needful formulae and had the assurance that their observations should be discussed and published for the benefit of all. Nay, there are unreduced observations enough now in the country, lying in the desks of those who made them, from which as much useful information may be gathered as we culled from the log-book, and I have no doubt that the desks and drawers of meteorological observers on the land would open quite as readily to the call as the old sea chests of the mariner did. As for the trial to see what a systematic plan of observations will do for the advancement of agricultural meteorology and for the benefit of farmers and planters, I'll answer for the observations if government will furnish the means for their discussion and publication. I'll go further, and promise that the observations shall be furnished for this purpose without cost. You know, the materials for the 'Wind and Current Charts' were all furnished gratuitously, and that without asking government for a single cent we have literally covered the ocean with floating observatories and converted every ship that sails into a temple of science? Not only governments, but nations and people have united with me and are assisting to carry out a system of meteorological research for the sea. As much may be done for the land if the planters and farmers will second the effort and tell their representatives in Congress that they want as much done by the government for agricultural and sanitary meteorology as it has permitted to be done at sea for the benefit of commerce and navigation. By the saving of time on the voyage, and the lessening of the dangers by the way, these interests, it has been computed both in this country and England, have been benefited to the extent of millions annually. Some of these benefits have inured also to agriculture not only by giving an opportunity to the farmer to get markets beyond the sea cheaper, and enabling ships to fetch and carry for him at lower figures, but by bringing within reach markets which before were inaccessible by reason of the great length in time of the voyage."

In the commercial conventions Lieutenant Maury was prominent, through letters or in person, in seeking to promote the growth of the country's commerce through Southern ports. He was an ardent advocate of the construction of an isthmian waterway, and, indeed, expected to see it established before 1857. Of the benefits to be derived from this undertaking he said:

"From the Gulf of Mexico all the great commercial markets of the world are down hill. A vessel bound from the Gulf to Europe places herself in the current of the Gulf Stream and drifts along with it at the rate, for part of the way, of 80 or 100 miles a day. If her destination be Rio, or India, or California, her course is the same as far north as the Island of Bermuda. And when there shall be established a commercial thoroughfare across the isthmus, the trade winds of the Pacific will place China, India, New Holland and all the islands of that ocean down hill also from this sea of ours. In that case the whole of Europe must pass by our very doors on the great highway to the markets both of the East and West Indies."

He had studied the tremendous possibilities of the valleys of the Mississippi and the Amazon in their relation to the commerce of the Gulf of Mexico and the Caribbean sea, which he called the Mediterranean of the West, and said in one of his greatest papers:

"The time is rapidly approaching, if it has not already arrived, when the Atlantic and Pacific must join hands across the isthmus. We have shown that there is no sea in the world which is possessed of such importance as this Southern sea of ours; that, with its succession of harvests, there is from some one or other of its river basins a crop always on the way to market; that it has for back country a continent at the north and another at the south, and a world both to the east and west. We have shown how it is contiguous to the first two and contiguous to them all. The three great outlets of commerce, the delta of the Mississippi, the mouths of the Hudson and the Amazon, are all within 2000 miles—ten days' sail of Darien. It is a barrier that separates us from the markets of 600,000,000 people—three-fourths of the population of the earth. Break it down, therefore, and this country is placed midway between Europe and Asia; this sea becomes the center of the world and the focus of the world's commerce. This is a highway that will give vent to commerce, scope to energy and range to enterprise, which in a few years hence will make gay with steam and canvas parts of the ocean that are now unfrequented and almost unknown. Old channels of trade will be broken up and new ones opened. We desire to see our own country the standard-bearer in this great work."

Maury did not confine his suggestion and his hopes to the Gulf coast. He was deeply interested in plans for establishing direct communication between the great basin of Hampton Roads of his native Virginia and European ports, and was of the opinion that had the legislature in 1839 agreed to the plans of the French promoters of a steam line running from Norfolk, that city would have become a great shipbuilder, with foundries and machine shops, and would have had ten or fifteen years' advantage of New York in the steamship business. Efforts to carry out such a plan were made from time to time, especially in 1850, when Congress was asked to charter a line between Virginia and Antwerp; a few years later, when the Franco-American Transatlantic Navigation Co. was talked of, and when a convention at Bristol, Va., appointed Ballard Preston, formerly Secretary of the Navy, to study in Europe the possibilities of steamer connection between the Continent and Virginia.

In 1856 an exceedingly attractive proposition was made to the South by Ambrose Dudley Mann, a native of Virginia. His idea was that a weekly line of steamers of 20,000 tons capacity should be established between the Chesapeake bay and Milford Haven, 120 miles southwest of Liverpool. This met the commendation of Southern conventions, and especially of one held at Old Point Comfort, over which ex-President Tyler presided, and at which a beginning was made of subscriptions to the stock of the Atlantic Steam Ferry Co., which was incorporated by the Virginia assembly in 1858. Maury saw in the near completion of the Covington & Ohio Railway, in connection with the Blue Ridge and the Central roads, a highway between Western Europe and the great West, in which the proposed line would be a direct link.

Mann held as one of the objects of his steam ferry the exploitation of the iron and coal of Virginia, Tennessee and Kentucky in quantity sufficient, as he estimated, to supply the wants of the Union for a hundred centuries, and the deposits in those States of copper, lead, gypsum and salt, together with the transportation to Europe of the cotton, tobacco, wheat and corn, pork, bacon and lard, rosin and turpentine and rice from thirteen States. He argued that the four vessels with which his company proposed to begin operations, of the type and size of the Great Eastern, when increased in number sufficient to give a weekly ferry service, would inspire the utmost respect for the American flag on the Atlantic; that as sails were to yield to steam or other motive power in navigation, and as the government could hardly undertake to transform at once the navy from sail to steam, these merchant vessels would become a nucleus for an extended naval service if required. And he said that "we must construct vessels both for the Atlantic and the Pacific, which, while they will carry the olive branch of commerce in one hand, will carry in the other the sheathed sword."

No one was more active in endeavor to further these Southern industrial, railroad and commercial schemes than De Bow. He was a man of wonderful parts. Graduated with honor in his native State, South Carolina, he was impelled by his experiences at the first Memphis convention to found for the development of the South and West his wonderful Review, which, in its thirty-odd volumes, published until the fall of New Orleans, embodied the facts and thoughts bearing upon materialities of the first half-century of Southern history. Without information drawn from those volumes it would be impossible to write that history. He was chosen in 1848 to the chair of commerce, public economy and statistics in the University of Louisiana, for the endowment of which Maunsel White of New Orleans was a leader, and which was probably the first chair of the kind established in the world. He was superintendent of the census of 1850, and as such produced a compendium, a model of its kind and indispensable in the study of sociology in this country, and after arduous and persistent work for sixteen years in behalf of the South in the Union, he was intrusted with the conduct of one of the important fiscal policies adopted in the early days of the Confederacy.

Words, deeds and hopes, however, of alert and wide-awake Southerners

were of no avail against the obvious trend of events for twenty years and more before the war.

Military leaders of the South made world records. Men in the ranks sustained against men of a manufacturing section and against the products and resources of the manufacturing age a struggle unparalleled for firmness of conviction and tenacity of purpose. But the inadequacy of means of internal communication soon manifested itself, while a pretty effective blockade of the Southern coasts demonstrated the slight value of a great staple crop with no ships at hand to give it market and with no means to encourage its manufacture.

Soon after the inception of the war a circular was sent from Richmond designed to elicit information about the condition of Southern manufactures, with especial reference to new undertakings. The replies, published as indications of "what we are gaining by the war," told of the revival of rope-making at Norfolk and of a cotton and wool factory at Charlottesville, of the establishment of an envelope factory, of a bottling factory and a lucifer-match factory at Lynchburg, of a shoe factory at Madison, of the manufacture of potash in connection with salt-making, and the making of tallow candles and peanut oil at Wilmington, of a linseed-oil factory, cottonseed-oil mill, hat factory and powder mill at Charlotte, of the invention and manufacture by Thomas W. Cofer, at Portsmouth, Va., of a seven-barreled revolving pistol, and of Thomas Carr's invention of a device for rifling cannon. At Portsmouth, too, the Union Car Works had changed to the manufacture of gun carriages, wagons, campstools, tent-poles, sabers, bayonets and bowie-knives, just as an establishment in Albemarle county, Virginia, formerly dealing in agricultural implements, had started to make gun carriages, caissons, harness and cartridge boxes, while guns were made at Greensboro, along with sewing machines, and Monroe, N. C., was making scabbards and straps for knapsacks, and using rifle barrels in the manufacture of pistols. At the time that James Chestnut, Jr., in the military service of the Confederacy, was asking, at Columbia, S. C., special aid for securing an adequate supply of nitre, and was pointing out where sulphur could be obtained from pyrites, the salt works near Abingdon, Va., were increasing their furnace capacity.

Of course, such items must be regarded as typical rather than comprehensive. There was another development even more typical of the situation. Early in 1861 the women of Ellis county, Texas, had formed a Homespun Society, whose members pledged themselves to wear apparel solely of Southern manufacture, and to use their influence to induce the men and women of the South to unite with them in the enterprise. The later reports to Richmond told of the females at spinning-wheels and hand-looms in Goochland, Va., of their "putting aside silks and pianos" and devoting themselves to the wheel, the cards and the looms "without distinction" at Carthage, N. C., and of every household at Chester C. H., S. C., being a manufacturing establishment, while the ladies in one district of Laurens, in the same State, "recently furnished for the uniforms of one company of volunteers 350 yards of very nice jeans, 500 yards of flannel and 350 pairs of socks in a very short time, made upon the old-fashioned hand-loom, which are numerous in this country, one in almost every family, and some of the cloth for service is equal, if not superior, to the best broadcloth, which costs from $1 to $1.50 a yard."

The necessity of the South suggested in these statements became even more intense as the time between Sumter and Appomattox hastened. It was one of the revelations of the failure of the South to meet its responsibilities to the extent justified by its potentialities.

A TANGLED SKEIN OF COTTON.

Revival of the passing use of the household spinning-wheel and the hand-loom in the South in 1860 pointed straight to the reason why the revival was necessary; for Southern history in the years between the first American Revolution and the second was in essence a tangled skein of cotton, the white threads twisted with the black in apparent permanency.

Within less than fifteen years after the first enduring settlement of Englishmen had been made in America the culture of free institutions, of slavery and of cotton side by side was begun. The growth of each of them was at first slow. It was not until the close of the seventeenth century and the beginning of the eighteenth that African slavery began to assume anything of its later proportions, and not until the inventions of Watt, Hargreaves, Arkwright, Crompton and Cartwright, paralleling the laying of the foundations of the republic and creating a great demand for the products of American slave labor, were capped and amplified by the invention of the saw-gin, making possible the employment of a greater supply of that labor in the cotton fields, that cotton became a dominating staple in Southern agriculture, and, linked with expanding slavery, a dominating influence in American industry, changing from hand to machine, and American politics, slowly working out the experiment in representative government.

Cotton spindles were more imperative than cotton fields for the saw-gin. That machine was of greater benefit to manufacturing in the North than to agriculture in the South. It confirmed the New England town in self-reliance. It strengthened habits of doing things and of making things to one's advantage, even under the disadvantage of the growing necessity of bringing the material from a distance. It added to textile mills the construction of textile machinery and of the manifold adaptations of iron to industry. It taught men to profit in persuading their fellows of weaker incentive to employ them to do their work requiring mechanical skill beyond the ordinary and to handle their goods. Men trained to the fisheries readily turned to coastwise and foreign carrying trade just as the prohibition of a once lucrative inward-bound commerce from the coast of Africa, embargoes and wars breeding secession sentiments of a Hartford convention, released capital freely into new and more satisfactory channels. The economic theory gained ground that as the individual was bettered so the State improved, while the politics that paid should regard the nation as existing for the good of the State. Co-operation of all for the gain of each finally bloomed into public spirit.

On the other hand, the self-content of the plantation was given a strong impulse, with a modification toward absorbing energies in one crop, cotton, tobacco or rice, and an inclination to look outside for supplies of various sorts. Wealth could not be rapidly accumulated by the man farming for himself, and however he might aspire to enter upon the planter career, the odds, in a majority of cases, were against him. Slaveholders increased in number from 1850 to 1860 only from 347,525 to 384,884. Steady as was their increase, slaves were, after all, limited in number. Comparatively few men could own as many as five. To be profitable, slavery must have the richest lands. Consequently, it is not surprising that parts of the South had their food brought from other sections. The plantation dwarfed the farm, and though in its perfection a striking illustration of the beauty of dispensing with alien mediums as far as daily intercourse was concerned, it was a powerful cultivator of the American middleman. It tended to center the interests of the individual in himself and his immediate associates without destroying his altruistic instincts, but left him at a loss frequently to know how to manifest them to the best. It created a political frame of mind which at times confused a long cultivation of theories absolutely correct for ideal humanity with devotion to abstract and adamant principle, unchangeable as Revelation. It developed sincerity and steadfastness of purpose and trained men to stand for conviction to the bitter end.

The broad results of the potency of cotton in the South's development are known. One of the most thrilling chapters of its dramatic history was closed in 1865. Of the many factors which must be considered to explain why that chapter had not a different ending, the main one was the population of the South.

Two hundred and fifty years ago there were no radical contrasts between the traits of men of Massachusetts and of Virginians. Both groups were of common origin. Each was of English stock. In another hundred years, however, environment as much as heredity had induced divergence which the better adaptability of slavery to Virginia and the section it represented than to Massachusetts and its section has fostered rather than framed. Another hundred years showed a wider separation. For that, slavery, through cotton, under the spur of the gin, was directly responsible in both sections. Its ill effects were felt chiefly by the Southern people.

No better index to their plight and their character at the close of the second period may be had, perhaps, than in an analysis of the statistics showing the nativity of the free population of the South and its location in 1860, and comparing the increase of whites and slaves there with that in the rest of the country between 1790 and 1860:

INCREASE OF WHITE AND SLAVE POPULATION IN THE SOUTH, 1790-1860.

States.	White. 1790.	White. 1860.	Increase. Per cent.	Slave. 1790.	Slave. 1860.	Increase. Per cent.
Alabama	.....	526,271	515.87	.....	435,080	938.90
Arkansas	.....	324,143	[2]2,476.86	.....	111,115	[6]6,771.68
District of Columbia	.....	60,763	[3]503.65	.....	3,185	[7]1.82[8]
Florida	.....	77,747	[3]322.89	.....	61,745	[3]298.33
Georgia	52,886	591,550	1,018.60	29,264	462,198	1,479.41
Kentucky	61,133	919,484	1,404.07	11,830	225,483	1,806.03
Louisiana	.....	357,456	[4]941.81	.....	331,726	[8]857.09
Maryland	208,649	515,918	147.27	103,036	87,189	15.38[8]
Mississippi	.....	353,899	[5]6,733.38	.....	436,631	[2]12,414.50
North Carolina	288,204	629,942	118.58	100,572	331,059	229.18
South Carolina	140,178	291,300	107.81	107,094	402,406	275.75
Tennessee	32,013	826,722	2,482.46	3,417	275,719	1,969.04
Texas	.....	420,891	[4]173.24	.....	182,566	[5]213.89
Virginia	442,115	1,047,299	136.88	293,427	490,865	67.29
Total	1,225,178	6,943,385	466.71	648,640	3,836,967	491.54
Total United States	3,172,464	26,957,471	749.73	697,897	3,953,760	466.53

[1]From 1820. [2]From 1800. [3]From 1830. [4]From 1810. [5]From 1850. [6]Decrease.

Delaware and Missouri are not included among the Southern States in this review. Geographically Delaware belonged to the middle section, and slavery was decadent there even at the time of the Revolution, while the slave population actually decreased from 8887 to 1798, or 79.76 per cent., between 1790 and 1860. Missouri, in spite of the compromise of 1820, belonged rather to the West than to the South, although its slave population increased in fifty years from 3011 to 114,931.

In the whole country the whites increased between 1790 and 1860 from 3,172,464 to 26,957,471, or 749.73 per cent., and the slave population from 697,897 to 3,953,760, or 466.53 per cent. In the South the increase was of whites from 1,225,178 to 6,943,385, or 466.71 per cent., and of slaves from 648,640 to 3,836,967, or 491.54 per cent. The rate of increase of whites in seven Southern States was below that for the whole country, and in six Southern States—Florida, Maryland, North Carolina, South Carolina, Texas and Virginia—below that of the South, though it must be remembered that the calculation was not for the period from 1790 to 1860 for all, the increase in Florida being between 1830 and 1860, and in Texas for only ten years. The rate of increase of slaves was far greater than the rate for the whole country in Alabama, Arkansas, Georgia, Kentucky, Louisiana, Mississippi and Tennessee, and much below that rate in Florida, North Carolina, South Carolina, Texas and Virginia, there having been marked decreases in Maryland and the District of Columbia, Maryland having nearly as many free negroes as slaves, while the process which had left less than 3000 slaves north of Maryland was rapidly at work in Virginia, Kentucky and Tennessee, where the rate of increase in the number of slaves in the ten years before the war had been but 3.88 per cent., 6.87 per cent. and 15.14 per cent., respectively.

Free negroes were an inconsequential element in the total, increasing as they did at a rate much below that of the slave, in spite of an increase in annual additions to their number through manumission, from 1467 to 3078 in the ten years before the war. In 1860 they numbered less than 500,000, and were about evenly divided between the North and the South.

Foreigners were not attracted to the South. Of the total of that class of population, 4,136,175, in the country in 1860, but 383,470 were in the South; consequently the study of certain facts about the South must deal almost entirely with the movement of the slave population and of the free natives of the South.

SHIFTING OF THE SOUTH'S NATIVE FREE POPULATION.

States.	Natives of, in State.	Natives of, elsewhere in South.	Natives of, elsewhere in country.	Total in United States.
Alabama	320,026	128,681	9,059	457,766
Arkansas	124,043	15,206	9,127	148,376
District of Columbia	34,005	4,018	4,461	42,484
Florida	35,602	5,891	879	42,372
Georgia	475,496	180,939	9,284	665,719
Kentucky	721,570	50,852	281,052	1,053,474
Louisiana	214,294	18,218	8,756	241,268
Maryland	481,061	34,514	102,744	618,319
Mississippi	195,806	61,622	7,419	264,847
North Carolina	634,220	195,635	76,971	906,826
South Carolina	276,868	177,944	15,445	470,257
Tennessee	660,589	201,554	143,202	1,005,345
Texas	153,043	4,099	3,257	160,399
Virginia	1,001,710	147,121	252,579	1,401,410
Total	5,328,333	1,226,294	924,235	7,478,862

In 1860 there were in the United States 7,478,862 free persons born in the South. Of these, 5,328,333 were in the State of their nativity and 2,150,529, or 28.7 per cent., were in other States, 1,226,294 being in other Southern States and 924,235 being outside the South. The restlessness in the Southern States is shown by the fact that of the natives of South Carolina 41.1 per cent. were living elsewhere, of Tennessee 33.2 per cent., of Kentucky 31.5 per cent., of North Carolina and Alabama 30 per cent., of Virginia and Georgia 28.5 per cent., of Mississippi 26 per cent., of Maryland 22.3 per cent., of the District of Columbia 19.9 per cent., the percentage of absenteeism in the other States being—Arkansas, 16.4; Florida, 15.9; Louisiana, 11.1, and Texas, which was gathering them in from all sides, but 4.5. Virginia led in number, 252,579, and Kentucky in percentage, 26.6, in natives living outside the South, the other percentages being—Virginia, 18; Maryland, 16.6; District of Columbia, 14.7; Tennessee, 13; North Carolina, 8; Arkansas, 6.1; Louisiana, 3.6; South Carolina, 3.2; Mississippi, 2.8; Texas, 2; Florida, 2; Alabama, 1.9, and Georgia, 1.3.

SOUTH'S FREE NATIVE POPULATION IN 1860 BY NATIVITIES.

States.	Natives of, in the State.	Other Southern-born in the State.	Other natives in the State.	Total natives in the State.	Foreign-born in the State.
Alabama	320,026	189,919	6,824	516,769	12,352
Arkansas	124,043	175,963	20,588	320,594	3,741
District of Columbia	34,005	19,201	6,195	59,401	12,484
Florida	35,602	36,503	3,265	75,370	3,309
Georgia	475,496	101,094	6,827	583,417	11,671
Kentucky	721,570	104,098	44,734	870,402	59,799
Louisiana	214,294	58,216	20,737	293,247	81,029
Maryland	481,061	10,566	30,697	522,324	77,536
Mississippi	195,806	139,597	10,713	346,116	8,558
North Carolina	634,220	21,348	2,696	658,264	3,299
South Carolina	276,868	12,059	2,389	291,316	9,986
Tennessee	660,589	137,345	14,922	812,856	21,226
Texas	153,043	189,722	35,462	378,227	43,422
Virginia	1,001,710	30,663	38,022	1,070,395	35,058
Total	5,328,333	1,226,294	244,071	6,798,698	383,470

Though 924,235 Southern-born were living elsewhere in the country, the rest of the country had contributed only 244,071 to the South's population, and natives living in other States than those of their nativity constituted 21.6 per cent. of the total 6,798,898 natives of the United States in the South. There, too, was a wide range in percentages, coincident, in some cases, with those which have just been considered. Of the 378,227 free native population of Texas, 225,184, or 59.5 per cent., had been born outside that State, and of the 320,594 free native population of Arkansas, 196,551, or 61.3 per cent., had been born elsewhere. The percentages of the other States were—Florida, 52.7; Mississippi, 43.4; District of Columbia, 42.7; Alabama, 38; Louisiana, 26.9; Tennessee, 18.7; Georgia, 18.4; Kentucky, 17.1; Maryland, 7.8; Virginia, 6.4; South Carolina, 4, and North Carolina, 3.6. The large percentage of outsiders in the District of Columbia was due to its being the seat of the general government. That fact accounted also in part for the presence in the District of 10.4 per cent. of persons born outside the South in its free native population. The District led in this respect, the percentages for the thirteen States being—Texas, 9.3; Louisiana, 7; Arkansas, 6.4; Maryland, 5.8; Kentucky, 5.1; Florida, 4.3; Virginia, 3.5; Mississippi, 3; Tennessee, 1.8; Alabama, 1.3; Georgia, 1.1; South Carolina, .8, and North Carolina, .4.

To the total native-born population of Texas, the youngest of the Southern States, Tennessee contributed 42,265; Alabama, 34,193; Georgia, 23,637; Mississippi, 19,902; Kentucky, 14,545; North Carolina, 12,138; Arkansas, 11,319; South Carolina, 10,876; Louisiana, 9660; Virginia, 9081; Florida, 1103; Maryland, 916, and the District of Columbia, 87.

Other light on this point is given in comparing the increase of the population of the six New England States between 1790 and 1860 with that of the population of the Southern group, Maryland, the District of Columbia, Virginia, the two Carolinas and Georgia. In the former the increase was 2,125,460, or 21 per cent., and in the latter 3,308,589, or 18.3 per cent. In 1860, 235,039 natives of Massachusetts, or 22.5 per cent., were living in other States, but Massachusetts had received 165,406 natives of other States, constituting 17 per cent. of its American-born population. Of natives of New England, 29.5 per cent. were living elsewhere than in the State of their nativity. In the period before the war New England possessed fewer inducements for rapid increase in population than it has since enjoyed, and its natural resources could not be compared at all with those of the Southern group of seaboard States.

In the region of the West where New England and the South met, their developments were interesting. In 1860 the natives of the United States in Illinois numbered 1,387,308, having increased from less than 13,000 in 1810. Of that population, 680,383, or 49.1 per cent., had been born outside the State, 165,497 of them coming from the South. The State had given but 134,736 of its natives, or 16 per cent., to other States. The total number of Southern-born in Illinois, Indiana and Ohio was 455,683, more than 50 per cent. of the Southerners living outside the South. The majority of these were from Maryland, Virginia, North Carolina, Tennessee and Kentucky, and these States were largely represented in the 275,825 Southerners in Missouri, constituting 30.4 per cent. of its total free American population. But Missouri had contributed but 27,662 to the population of the South, and 21,125 of these were in Arkansas and Texas.

This analysis indicates pretty clearly definite lines of migration in the steady shifting of the South's population for nearly 100 years before the war. The stronger and wider current for both whites and negroes was from the older States on the Atlantic coast toward the Southwest, where in Texas, with the Rio Grande barring further progress, it mingled with a secondary current from the upper Mississippi valley States. The other main current had its sources in the territory from Georgia to Mason and Dixon's line, and, while bearing some slaveholders, largely represented the great body of non-slaveholders, and particularly those whose main hope lay in putting themselves entirely outside the South. The combination of these two movements reduced the weight of slavery in the older States without removing to any considerable extent the influence of the institution as against the adaptation of the white population to other pursuits than agriculture or the preparation of raw material for manufacturing, and in the new States the population followed its natural bent toward agriculture, which, indeed, gave the most ready, if not the largest returns for work, and, besides, men were too busy bringing nature into subjection to have energies to spare for the factory and machine shop.

Cotton-growing, together with the raising of crops associated with cotton-growing, by slave labor was the attraction toward the Southwest. The tendency of extensive agriculture under the one-money-crop idea was to waste the soil, and with depleted crops to move to other fields. That is why slavery slowly declined in the longer-settled portions of the South. The virgin soils of the Gulf States were too strong a temptation for many slaveholders, and often outweighed considerations of attachments to homesteads and neighbors. Many a one, moving, like Thomas Dabney of Virginia, in caravan with household and servants from tidewater into the heart of Mississippi, changed from wheat and tobacco growers to cotton or cane raisers. This migration was probably strongest between 1820 and 1840. Its manifestations may be traced in comments of the time. President Thomas R. Dew of William and Mary College, in a comprehensive critical survey of the action of the Virginia assembly of 1830-31, which was on the verge of providing for gradual emancipation, said that Virginia was at the time exporting slaves to the South at the rate of about 6000 a year, and the correctness of his estimate was proved by the fact that in 1840 there were 20,670 slaves less in Virginia than in 1830. A similar point of view was that held by De Bow in 1849 at the time of a vigorous agitation for emancipation in Kentucky. He wrote: "Kentucky 'must be free,' we admit, but it will be when the superior Southern demand shall draw off by degrees her slaves, and the continued increase of white population shall make the relative proportion of colors but a fraction of what it now is, and altogether unimportant." So Dr. J. C. Nott of Mobile, in an address in 1850, said:

"Slavery is already virtually abolished in the District of Columbia. In consequence of the incessant agitation in Congress and the growth of the abolition party, this species of property has become insecure, and the slaveowners, from prudential motives, have been ridding themselves of their slaves, who are now reduced to but a handful. Even in Baltimore, by the census of 1840, out of 20,000 negroes there were but 3000 slaves, and this drain is going on in all the frontier slave States, while the slaves are emptied into the Gulf States. Few realize the rapidity with which this process is going on. In Alabama there were in 1820 but 41,000 slaves; in 1830 they had increased to 117,000; in 1840 the number had reached 253,000, and it remains to see what the census of 1850 will show. How long will it be before Alabama must pass and enforce laws against the further introduction of slaves? The slaves double in thirty years by natural increase, and with the immigration our children will see around them in this short period at least 1,000,000. All the cotton and sugar States will be in the same crowded condition, and each will be passing laws for its own protection. Kentucky is already agitating the question of abolition within her own borders, and it requires no prophet's eye to see that emancipation is inevitable in all the farming States where white labor can be advantageously used."

Dr. Nott here touched upon the political aspect which the southwesterly movement of slaves was causing to assume considerable importance in some quarters. Dr. Samuel A. Cartwright of New Orleans also alluded to this in 1851, when he wrote: "Delaware and Maryland are now in a transition state preparatory to becoming free States, selling their slaves to Southern planters until their numbers be so far reduced as to make emancipation of the balance safe and practicable." He, too, recognized the futility of attempts suggested at the time to extend the institution of slavery beyond the line of the Missouri compromise, and wrote that "If negro slavery, from mistaken notions, be carried into a State or small Territory where slave labor is less efficient and profitable than white labor, natural causes will correct the mistakes, as they have done in the Northern States and in Alpine Virginia, by forcing it out again." Alluding again to the ability of small proprietors of negro property in Maryland, Virginia, Kentucky and Missouri to supply the loss of slaves on the large Southern plantations, he wrote: "The cotton States and Louisiana are sucking the lifeblood out of Virginia by draining that noble old State of her agricultural laborers. The high price of negroes is ruining Virginia. In Sussex, Southampton, Northampton and many other counties which send their negroes to the cotton States the inhabitants have lost more in the price of their land than they have gained in the high price they got for their negroes."

Ex-Governor H. S. Foote of Mississippi, speaking on the same line, said: "Why is it apprehended that Virginia and the other Middle States are very much inclined to emancipation? Because slave labor is unprofitable. It is an admitted fact now that if you stop the exportation of slaves from Maryland, Delaware and Virginia, these States would be compelled in less than ten or fifteen years to emancipate their slaves," because "they cannot work them profitably on farms."

Somewhat earlier it had been pointed out that tobacco and cotton culture in the fresh lands of Alabama, Mississippi and Louisiana, and sugar-growing in Louisiana and Texas, had made heavy drafts on the slavery of States farther north and east, and that "the agriculture of Virginia, Kentucky and Tennessee is annually assuming a character which will render the amount of slave labor required for its purposes less and less. Indeed, we have heard it surmised that but for the impolitic interference of others in our municipal con-

cerns, each of these States would ere this have taken incipient steps toward a prospective emancipation, so that another generation might have seen the Roanoke and the Cumberland mountains as the northern boundary of this institution, instead of the Potomac and the Ohio as now."

As late as 1854 and 1855 there was still talk of this draining of the slaves from Maryland and Virginia by a sale or transference, and W. B. Goulden of Georgia, one of the leading advocates at that time of a reopening of the African slave trade, criticised the opposition to the plan, and said that practically the same thing was being done every day "when they went to Virginia and took the negro from home and family and brought him to work their rice and cotton fields." A supporter of the proposed system of African apprentice labor, which was regarded at the time as a disguised form of reopening the slave trade, James H. Brigham of Louisiana, advocated the bringing in of fresh laborers from Africa to check the exodus of slaves from the border States, and said: "As long as the people of the cotton-growing States will continue to look solely to the more northern slave States for their supply of labor, and thereby drain those States of their slave population, so long will they be in part aiders and abettors of our enemies in their schemes for abolitionizing the South. This draining process upon those States which has so long been going on must cease, or otherwise, in the course of not many years, the boasts and predictions of the abolitionists will be partially realized, and slavery, indeed, be wiped out from those States."

It must be remembered that there was something of retaliation in these later utterances, inasmuch as the upper tier of Southern States, which eighty years before had set their faces against the African slave trade, and which had felt more immediately than other States the depressing effects of the institution, were not found among the supporters of the wild schemes which were voiced in a resolution of a supposed commercial convention of the South in 1859 that all laws against the African slave trade be annulled. It must also be recalled that the views as to the means employed for moving the slaves from the border States southward were not unanimous, and Edmund Ruffin of Virginia, while recognizing the drain upon his native State, wrote in 1858: "Probably but few owners of slaves have voluntarily sold them merely on the consideration that it would be more profitable to sell than to retain them as laborers and as agricultural capital. * * * Whenever debt or necessity or the legal division of slaves among heirs compels the sale of slaves, nearly all must be sent abroad. It is supposed that the annual draft and depopulation thus made on our stock already exceed in number all the increase of slaves in Virginia by procreation. This loss must continually increase with the potency of the producing causes, and with increasing rapidity, and sooner or later the operation must remove so many of our slaves as necessarily to destroy the institution of negro slavery within the limits of Virginia."

That there was a market to the south Mr. Ruffin even recognized in his contention that the increase in the price of slaves in Virginia was not caused by an actual increase in the value of their labor and products at home, but by higher rates and a greater demand for them abroad. Still, while that market was a decided influence in reducing the slave population of the border States, which was, moreover, diminished by voluntary emancipation by individuals, as in the case of John Randolph of Roanoke, the movement of free negroes to the Northern States, and genuine runaways slowly decreasing in numbers between 1850 and 1860, there was a perfectly normal migration without change of ownership. The Nat Turner insurrection and the consequent agitation for emancipation in the Virginia legislature undoubtedly hastened the tendency of Virginians to seek homes where their property would be safe. But the drift in the main was largely economic rather than commercial in its origin and conduct, and, of course, affected profoundly Southern economics of the time.

It was resisted in vain, and the explanations of it were not always entirely accurate. But there was considerable wisdom bearing upon one of its motives in the words of Ruffin, who, having distinguished himself in the leadership in America for the conservation or restoration of soils, said: "If Virginia had merely retained and improved the fertility of her present reduced surface, her people would not have removed. Their descendants would now be south of the Ohio, ready and able to maintain the rights of Southern States, instead of a large proportion, as now, serving to swell the numbers and give official power to our most malignant enemies. The loss of both political and military strength to Virginia and South Carolina is, not less than all other losses, the certain consequence of the impoverishment of their soil."

Ruffin probably mistook secondary for primary reasons for the location of Southerners and their descendants north of the Ohio. They came, first of all, from the pioneer stock who in colonial days had crossed the mountains and blazed the trails into the territories out of which Ohio, Kentucky, Tennessee, Alabama and Mississippi were later created. Following them were the class who could not use slavery, and who opposed it. Later came the more sturdy of that element in the population which had been crowded by slavery from the choice soils. There can be little doubt that a strong impulse in the migration from the South beyond the Ohio was the determination to get beyond the immediate influence of the institution of slavery. This appears in the pamphlet of Dr. Henry Ruffner, president of Washington College, Virginia, addressed by "a slaveholder to the people of Western Virginia," and intended to show that "slavery is injurious to the public welfare, and that it may be gradually abolished without detriment to the rights and interests of slaveholders." He argued that slavery drove free laborers, farmers and mechanics out of the country, filling their places with negroes, and that industrious and high-spirited workmen would not stay where slavery degraded the workingmen. It appears, too, in the efforts in South Carolina to prevent the hiring out of slaves in competition with white mechanics, in the protest of a Georgian, "one of the people, one of the poor peasants of the land," against the program of the fifties, and in the fear expressed that the dominant element, if successful, might adopt a proscriptive policy against a large minority. This latter sentiment, based upon the hesitation of a dominant class to yield to the demands for manhood suffrage, which were given a strong impetus during the Jacksonian era, prevailed, doubtless, among migrants to the newer Southern States, where greater political privileges could be enjoyed. Virginia, which did not reach suffrage upon a white-manhood basis alone until 1851, illustrated well in its convention of 1829-30 the feelings of the disbarred class. In that convention a main issue was whether representation in the assembly should be apportioned according to the number of white persons or according to white persons and a proportion of slaves, the vexatious question fastened upon American politics in one of the compromises in the Federal Constitution. Paralleling this was the cry for the abolition of property qualification of voters. The reasons for this were set forth in a dignified memorial from the non-freeholders of Richmond. They said, through Walter D. Blair, chairman, and John B. Richardson, secretary: "Your memorialists, as their designation imports, belong to that class of citizens who, not having the good fortune to possess a certain portion of land, are, for that cause only, debarred from the enjoyment of the right of suffrage. Experience has but too clearly evinced, what, indeed, reason had always foretold, by how frail a tenure they hold every other right who are denied this, the highest prerogative of freemen. The want of it has afforded both the pretext and the means of excluding the entire class to which your memorialists belong from all participation in the recent election of the body they now respectfully address. Comprising a very large part, probably a majority, of male citizens of mature age, they have been passed by like aliens and slaves, as if destitute of interest or unworthy of a voice in measures involving their future political destiny, whilst the freeholders have, upon the strength of that possession alone, asserted and maintained themselves the exclusive power of new-modeling the fundamental laws of the State; in other words, have seized upon the sovereign authority."

On motion of Chief Justice Marshall, who felt that, however opinions might differ, the subject was one of the deepest interest and well entitled to serious attention, the memorial was referred to a committee. But the question was reverted to again and again in the convention, as members, on the one hand, advanced the argument that the possession of slaves meant additional taxation, and hence the right to greater weight in representation, and, on the other, that undue advantage was thus given to Eastern Virginia over Western Virginia, where slaves were few and far between, and the distinction was drawn between a majority of numbers and a majority of interests. The result was a compromise, but the echoes of the convention were heard in the next general assembly, in which, under the spur of the Nat Turner massacre, strenuous efforts were made to plan for the gradual relief of Virginia from its slave population. Some of the views expressed by representative men were startling in their boldness, and, commmenting upon them, Professor Dew said: "To these doctrines we call the serious attention of the whole slaveholding population of the Union, for all alike are concerned. * * * This doctrine, absurd as it may seem in its practical application made by the speaker, will be sure to become the most popular with those abolitionists in Virginia who have no slave property to sacrifice. * * * If a convention of the whole State of Virginia were called, and in due form the right of slave property were abolished by the votes of Western Virginia alone, does anyone think that Eastern Virginia would be bound to yield to the decree? Certainly not. * * * In forming the late constitution of Virginia the East objected to the white-basis principle upon the very grounds that it would enable Western to oppress Eastern Virginia through the medium of slave property."

These facts have been recalled to throw some light upon the position of that great body of Southern whites, the non-slaveholders. Excepting so far as it has been revealed in the co-operation with other whites, their history is yet to be written. The appearance of Hinton Helper's book appealing to non-slaveholders brought out between 1857 and 1860 a number of counter arguments and statements about them. For example, that vigorous writer, "Python," said to be close to an ex-President of the United States, had discovered in Maryland, in Northern and Western Virginia, Eastern and Northeastern Kentucky, Western North Carolina and Eastern and Middle Tennessee, in addition to merchants of the Gulf towns, many non-slaveholders whom he thought had come principally from the North, and who were an important element at the time when the John Brown raid had outraged the law and order of the country. He also criticised the slaveholders for "pursuing the unwise and selfish policy of training up their slaves to the mechanic trades and hiring them out in competition with white mechanics, thus degrading mechanical pursuits to the condition of menial services," and for having "originated in all directions among the no-property men of the South, whether from the North or born to the manor, a feeling of deep-rooted jealousy and prejudice, if not hostility, to the institution of negro slavery."

Meeting these rather strenuous views was a lengthy letter, published in 1861, from De Bow to R. N. Gourdin of South Carolina. De Bow took the ground that the sons of non-slaveholders were and had always been among the leading and ruling spirits of the South in industry as well as in politics, and he instanced the McDuffies, Cheeves, Jacksons, Hammonds, Orrs, Memmingers, Benjamins, Stephenses, Soules, Simmses, Porters, Magraths, Browns, Maunsel Whites and Aikens. He classed among the non-slaveholders merchants, traders, mechanics, laborers and other classes in towns and cities, and the tillers of the soil, where slave property could not or would not be profitably employed, and he argued "that it would be the baldest absurdity to suppose that the poor farmers of South Carolina, North Carolina and Tennessee who grow corn, wheat, bacon and hogs and horses are brought into any sort of competition with the slaves of these or other States, who, while they consume these commodities, produce but little or none of them. The competition and conflict, if such exist at the South, between slave labor and free labor is reduced to the single case of such labor being employed side by side in the production of the same commodities, and could be felt only in the cane, cotton, tobacco and rice fields. Now, anyone cognizant of the actual facts will admit that the free labor which is employed upon these crops, disconnected with and in actual independence of the slaveholder, is a very insignificant item in the account, and whether in accord or in conflict, would affect nothing the permanency and security of the institution. It is a competition from which the non-slaveholder cheerfully retires when the occasion offers."

...argumentative description of the non-slaveholders was printed in italics for emphasis. He wrote:

"The non-slaveholder of the South is assured that the remuneration afforded by his labor over and above the expense of living is larger than that which is afforded by the same labor in free States.

"The non-slaveholders, as a class, are not reduced by the necessity of our condition, as is the case in the free States, to find employment in crowded cities and come into competition in close and sickly workshops and factories with remorseless and untiring machinery.

"The non-slaveholder is not subjected to that competition with foreign pauper labor which has degraded the free labor of the North and demoralized it to an extent which, perhaps, can never be estimated.

"The non-slaveholder of the South preserves the status of the white man, and is not regarded as an inferior or a dependent.

"The non-slaveholder knows that as soon as his savings will admit, he can become a slaveholder, and thus relieve his wife from the necessities of the kitchen and the laundry and his children from the labors of the field.

"The large slaveholders and proprietors of the South began life, in great part, as non-slaveholders.

"But should such fortune not be in reserve for the non-slaveholder [the possibility, for instance, as an overseer of marrying the widow of a slaveholder], he will understand that by honesty and industry it may be realized to his children.

"Without the institution of slavery the great staple products of the South would cease to be grown, and the immense annual results which are distributed among every class of the community and which give life to every branch of industry would cease.

"If emancipation can be brought about, as will undoubtedly be the case, unless the encroachments of the fanatical majorities of the North are resisted now, the slaveholders, in the main, will escape the degrading equality which must result by emigration, for which they have the means, by disposing of their personal chattels, while the non-slaveholders, without these resources, would be compelled to remain and endure the degradation."

Despite the plausibility of these arguments from one standpoint, as far as the majority of the non-slaveholders were concerned, they hardly touched hundreds of thousands of whites whose condition was revealed principally in support of the agitation for the revival of industrial energies between 1845 and 1855. M. Farmer of Missouri, writing in 1847 of the opportunities for the introduction of manufactures into the South and Southwest, noted a decadence among the rural non-slaveholders, who generally had small means and were cultivating sterile lands, and he said: "I have observed of late years that an evident deterioration is taking place in this part of the population, the younger portion of it being less educated, less industrious, and in every point of view less respectable than their ancestors." In North Carolina was found "surplus labor now without employment" which would be amply sufficient to raise up a manufacturing industry. Dr. Cartwright noted in 1851 that in New Orleans the larger part of the drudgery work requiring exposure to the sun, as railroad-making, street-paving, dray-driving, ditching, building, etc., was performed by white persons. John G. Gamble of Florida found in the cotton States "a numerous white population scattered over the pine barrens and subsisting by hunting and raising stock," who from their dispersed conditions could not "have either schools or churches, and their chidren must grow up without religion and ignorant of even the alphabet." The executive committee of the South Central Agricultural Society of Georgia had its eye on "the white rural population abounding in all the Southern States, whose condition and comforts would be improved by being operatives in factories," while J. L. Lumpkin of the same State, meeting the objection that manufacturing establishments would become hotbeds of crime to the destruction of public morals, wrote: "I am by no means ready to concede that her poor, degraded, half-fed, half-clothed and ignorant population, without Sabbath-schools or any kind of instruction, mental or moral, or without any just appreciation of the value of character, will be injured by giving them employment which will bring them under the oversight of employers who will inspire them with self-respect by taking an interest in their welfare."

In South Carolina the statement was made that "the labor of the poor pine lands in the lower part of the State and the poor lands of the middle districts and the tract of country bordering on the mountains and in the mountains can be procured for manufacturing purposes at as low rates as that of slaves," while Mr. J. H. Taylor of Charleston, who calculated that the poor men of the State would largely outnumber the rich, spoke of "white labor to a great extent contending with absolute want" and to "scattered ignorant and poverty-stricken families," and in contesting the opposition to factories where these people could be elevated "from wretchedness and ignorance to competence and intelligence," said: "So long as these poor but industrious people could see no mode of living except by a degrading operation of work with the negro upon the plantation, they were content to endure life in its most discouraging forms, satisfied that they were above the slave, though faring worse than he." Governor Hammond of that State estimated that 50,000 South Carolinians in 1850, one-sixth of its white population, were not making enough at industry "to procure them honestly such a support as every white person in this country is and feels himself entitled to. And this, next to emigration, is, perhaps, the heaviest of the weights that press upon the springs of our prosperity. Most of them now follow agricultural pursuits in feeble yet injurious competition with slave labor. Some, perhaps not more from inclination than from the want of human encouragement, can scarcely be said to work at all. They obtain a precarious subsistence by occasional jobs, by hunting, by fishing, sometimes by plundering fields and folds, and too often by what is in its effect far worse, trading with slaves and seducing them to plunder for their benefit."

By far the most vigorous commentator upon these distressing conditions was William Gregg. He noted in Charleston hundreds of women "in wretched poverty unable to procure work by which they would be glad to earn a decent living." He told the South Carolina Institute that "a large portion of our poor white people are suffered to while away an existence in a state but one step in advance of the Indian of the forest," and in another place, alluding to the same class as "a noble race of people, reduced to a condition but little above the wild Indian of the forest or the European gypsy, without education, and in many instances unable to procure the food necessary to develop the natural man," he said: "Shall we pass unnoticed the thousands of poor, ignorant, degraded white people among us who in this land of plenty live in comparative laziness and starvation? Many a one is reared in the proud South Carolina from birth to manhood who has never passed a month in which he has not some part of the time been stinted for meat. Many a mother is there who will tell you that her children are but scantily supplied with bread, and much more scantily with meat, and if they be clad with comfortable raiment, it is at the expense of their scanty allowance of food."

Gregg was of the opinion that "the only means of educating and Christianizing our poor whites" was to bring them into manufacturing villages, where they could not only become intelligent, but a thrifty and useful class in the community, and in his fifth annual report as president of the cotton-mill company in flourishing condition at Graniteville he said that the population of that place was made up largely of the poor of Edgefield, Barnwell and Lexington districts, who from extreme poverty and want had become a thrifty, happy and contented people. Later he held as preposterous the idea that there was necessity of importing wild Africans because of a lack of laborers at the South. He cited thousands of persons who had been drawn into railroad employments, and the constant pressure by those seeking employment upon railroad companies and manufacturers, overstocked mercantile establishments and counting-houses importuned all the time for places, and the overrun professions, and "hundreds of families moving from place to place in wretched poverty seeking employment as factory operatives." He asserted that the cultivable lands in the old Southern States were very much worn out, and could not be reclaimed except by grain and stock raising, for which there was no inducement, inasmuch as there was no consuming population affording a market for grain and meat, and he added: "When a foreigner learns this and has a true picture of the South laid before him, setting forth the fact that one-half of our white people who are willing to work cannot procure employment; that able-bodied men are roaming about the country glad to get work at seventy-five cents a day and find themselves, when similar labor commands a dollar or more at the North and West, is it at all surprising that he does not come to the South." Gregg argued, too, that signs of accumulation of wealth were not to be found except in the enhanced value of lands and negroes. The figures of property values in the South in 1850 and 1860 bear out this contention.

Statements about the unfortunate condition of so many non-slaveholders explain to some extent the absence of spontaneity in some portions of the South in support of the program set by South Carolina in 1860, the lack of enthusiasm, if not actual resistance to it, in an irregular belt of territory stretching from Maryland to Tennessee, which was not overcome even when the character of the Southern struggle had reached a plane much higher than its origin, and certain political developments of these latter days. There was a wide separation as to materialities between the class of whites who were found anxious to engage as employes in manufacturing industries and the class who, because of the importance of cotton-growing in their minds, rendered it impossible for the latent manufacturing instincts of their section to find adequate expression in action. They constituted the population which in conventional history stands as typical of the Southern people, and which was about one-third of the total white population of that section. It is interesting in this connection to recall De Bow's description of the method employed to reach an estimate of the number of the slave-holding population. He wrote:

"When in charge of the National Census Office, several years since, I found that it had been stated by an abolition senator from his seat that the number of slaveholders at the South did not exceed 150,000. Convinced that it was a gross misrepresentation of facts, I caused a careful examination of the returns to be made, which fixed the actual number at 347,525, and communicated the information by note to Senator Cass, who read it in the Senate. I first called attention to the fact that the number embraced slaveholding families, and that to arrive at the actual number of slaveholders it would be necessary to multiply by the proportion of persons which the census showed to a family. When this was done, the number was swelled to about 2,000,000. Since these results were made public I have had reason to think that the separation of the schedules of the slave and the free was calculated to lead to omissions of the single properties, and that on this account it would be safe to put the number of families at 375,000 and the number of actual slaveholders at about 2,250,000."

That this minority was able during the first seventy years of the life of the United States, and in the midst of training a race of barbarous origin into habits of work and of equipping it with the elemental tools of civilization, to dominate not only the social, economic and political career of the South, but also, directly and indirectly, that of the United States, which under Southern auspices expanded from thirteen States fringing the Atlantic seaboard and occupying a gross area of 827,844 square miles into more than forty-four States and Territories with a gross area of 3,025,600 square miles, bounded by the Pacific and Atlantic, is a proof of its wonderful capacity in initiative and administration.

The earlier statesmanship of the South was distinctively constructive. It was broadly unselfish. Thomas Jefferson in his practical solution of the dilemma of Louisiana's acquisition illustrated one phase, and John C. Calhoun, promoting, in spite of his education in the free-trade New England of his college days, a measure for the assistance of home industries, was an exponent of the second. He, however, became foremost in the veering, under compulsion from without, of that defensive statesmanship which gave birth in its extremes to the politics of reactionary conservatism combating the politics of revolutionary radicalism.

At the time when, under ordinary circumstances, the South might have

entered upon the enjoyment of well-balanced agriculture, manufacturing and commerce, the politics born in the struggle against the tendencies which were to overturn the civilization of the South absorbed much of the energy of the dominant whites.

In the course of this struggle the statesmanship of the Virginia type, having its home in the regions where the passing of slavery was opening the door to manufacturing, waned before the statesmanship of Carolina and Mississippi, banked largely upon cotton-growing. The result was a fulfillment of the prophecy of 1787 of George Mason of Virginia. He held that slavery discouraged the arts and manufactures; that it depressed white labor and prevented the incoming of other whites, and in stating his objections to the compromises of the Constitution between Northern commercial interests and Southern planting ones, he marked out the course of Northern advancement and the cause of Southern halting in urging that the North and East would be able to monopolize trade, and that the continued importation of slaves for twenty years would make the country weaker, more vulnerable and less capable of defense.

The importance of the staple, which had been defined in the expansion of slavery, did not prevent resistance by the North of the Southern plan, nor did it bring England to a material recognition of the Confederacy. The early financial measures at Richmond dependent upon cotton were unsuccessful. Henry Timrod, under the spell which lurked "in the little boll," penned his war lyrics in vain.

MAKING SURE THE PROMISES.

It is the habit to speak of the South of 1865 as bereft of all save honor. That was true from one point of view. In four years quite a tenth of its white population, the flower of the elements upon which depended its immediate future, had been withdrawn from the peaceful pursuits that make for permanent advancement of a country. At least 250,000 of these had been killed or disabled for life. The rest of the population had been occupied in sustaining the armies and itself upon a steadily contracting basis. The end found cities in ruins, mills and factories destroyed, railroads wrecked, barns and granaries burned, live-stock at the minimum, and thousands of individuals plundered of their personal belongings. Capital had vanished. The very ground in some parts had been harried into infertility. Property, the main reliance for the bulk of creative labor, and valued at not less than $2,000,000,000 before the war intervened, had been forcibly confiscated from separate owners, and, in so far as it was thus deprived of intelligent oversight and control, depreciated in value, while the lands it had tilled had deteriorated equally as much.

But there was not absolute wreck. The vanishing of slavery had not been necessarily an absolute loss to the State from the labor standpoint. There were millions of acres of land still untouched by the plow, and immense areas covered with valuable timber. Vast underground riches were waiting the drill and the blast. All the cotton mills had not been burned. The majority of the people had been freed from an institution which had sadly hampered them. The surviving followers of Lee, Jackson, the Johnstons, Longstreet, Hampton, Forrest, Stuart, Beauregard and others, having bravely exemplified the fundamental characteristics of sterling Americans, were in defeat at arms by no means lacking in the spirit that had long sustained them. Accepting the results of the conflict as irreversible, they were, in common with the great mass of their fellows, ready to adjust themselves to new circumstances and to undertake the mighty task of rebuilding from the ground. Almost before the last of the victors had laid aside their weapons the prevailing sentiments of the thinking South were epitomized by De Bow in announcing the revival of his Review, which had not been published for three years. "Regarding the issues of the past as dead," he wrote, "about which a practical philosophy will not dispute, and those of the present as living and potential, it is the part of the Review to accept in good faith the situation and deduce from it all that can be promotive of the best interests of the whole country," and he pointed to the South as offering unsurpassed opportunities for the investment of capital and attraction of immigration.

That was in October, 1865. It was a dream as substantial in its basis as had been the earlier ones. But within a few months the South was overrun by shifting immigrants, whose bane has not yet entirely departed. A bar was raised against capital which fifteen or twenty years were required to displace, and in their poverty and weakness the Southern people, under the menace of legislation grounded in ignorance, petty partisan politics, vindictiveness and malice, to say nothing of shortsighted self-interest, were obliged to spend themselves single-handed in a struggle for the maintenance of white civilization upon this continent.

Though the census figures of 1870 may not be reliable in every respect, they may, in comparison with those of 1860 and 1850, as far as they deal with manufactures, serve as an indication of conditions in the South in the days of redestruction, if that word may be permitted. Between 1850 and 1860 the value of the products of industry increased from $1,019,109,616 to $1,885,861,676, or at the rate of 85 per cent., in the whole country, and from $136,606,221 to $240,609,780, or 76 per cent., in the South. In the next decade, according to the census, the advance was to $4,232,325,442, or 124 per cent., in the whole country, and to $363,606,423, or only 51 per cent., in the South. But even with their defects, these figures point to the wide difference between the enormous strides in manufacturing made outside the South during the war and following it and the crippled condition of the South, the more marked when the figures of the States forming the Confederacy are alone considered. The difference still appears, though modified, in a comparison of the figures of 1860 and 1880, which show an increase of $3,483,717,515, or 185 per cent., in the whole country, and but $216,844,997, or 90 per cent., in the South.

By 1880, however, with the diminution of many of the curses of reconstruction and the elimination of political adventurers and blacklegs from activity in public affairs, and in spite of the utter demoralization of the negroes, recuperation had fairly begun. Southern men could not be crushed. Southern natural wealth must be made available. The soil was still productive. When arms had been laid aside it was entirely natural for Southern men to turn first to the old staple crops, particularly cotton, as the quickest means for making a living, and to raise what crops they might with their own hands or with the inefficient aid of freedmen, then beyond their wise control. At this time the importance of the negro in cotton-raising was somewhat diminished, but there was an increase in the crop of cotton from 2,278,000 bales in the season of 1865-66, which was 1,500,000 bales less than the crop of 1860-61, to 4,347,000 bales in 1870-71, and to 6,606,000 bales in 1880-81. That was a record-making crop, but a greater record, 11,256,000 bales, was made in 1898-99. In the meantime the manufacture of cotton had been resumed, and in 1880 the South had 160 mills, with 583,696 spindles and 12,194 looms, using 188,744 bales of cotton, while the total number of mills in the country was 751, with 10,678,516 spindles and 227,156 looms, using 1,570,342 bales. In another ten years the South was using 546,894 bales, or 23 per cent. of the total used in the country, and the number of its spindles had nearly trebled, while last year, with more than 5,500,000 spindles, or more than a fourth of the total in the country, the Southern mills took 1,620,931 bales, or 45.17 per cent. of the total consumed in the country. The products of cotton-seed mills in 1901 were valued at $47,500,000.

The iron industry had likewise begun to show new life. In Tennessee an attempt had been made with coke ovens in the later sixties. Birmingham was founded in 1871, and Anniston the next year, followed by Sheffield in 1883 and Bessemer in 1887, but it was not until 1895 that Alabama pig-iron was sold at Liverpool for less than the English iron of Middlesboro, the first step toward a situation which enables Southern iron to lead in exports of that material whenever a slackening in the American demand gives a surplus. Around the Birmingham furnaces grew up steel mills, cast-iron-pipe establishments, stove foundries, boiler and engine works, wire-nail mills, cement works using the refuse slag, car shops and car-wheel works, the furnace at Shelby, which was heard from in Mobile bay thirty-six years ago, setting the standard for the material used in car wheels and axles in this country.

Maryland, which had been foremost in the iron industry under the old charcoal methods, became in 1887 the home of the only great iron and steel plant of its kind on the Atlantic coast of the United States. The erection of this plant at Sparrow's Point at an outlay of between $10,000,000 and $12,000,000 was regarded as marking a reversal of the drift of the iron and steel industry toward the Great Lakes. The plant includes four furnaces with a capacity of 1200 tons of pig-iron daily, a large steel-rail mill, a foundry and machine shop, and a shipyard. Most of the ore used comes from Cuba, though some Mediterranean ores are also used, and while the coke and coal are now brought principally from Pennsylvania and West Virginia, an extensive coke plant in course of erection at the works will produce the coke needed, the gas thus generated being used for purposes of illumination and for fuel. The steel rails made here are sold in five continents. The shipbuilding connected with this enterprise is the highest development on that line in Maryland, which has been building ships for more than 225 years, and which at one time with its "Baltimore clippers" contributed so notably to the commercial prestige of the United States. At Baltimore since 1890 have been built vessels for the United States navy and the first oil-tank steamer to be constructed on this side of the Atlantic, while at Sparrow's Point was turned out the first steel tramp steamer ever built in the United States, and there, too, was realized the aspiration of the Memphis convention of 1845 in the building, for the Algiers naval station at New Orleans of the largest steel floating dry-dock ever constructed in the world.

Farther down the Chesapeake, Newport News has grown in fifteen years from a small hamlet to a great manufacturing and steamship center, with its shipbuilding industry employing 6000 men, while at Richmond, not far away, the manufacture of the boilers for the battleship Texas in 1890 at one of the leading locomotive works in the country led to the establishment of another shipbuilding plant, which has competed successfully with older ones for the building of United States war vessels. The development of the steel industry in Alabama points, too, to shipbuilding at one or more of the Gulf ports, while iron-making in Virginia, Tennessee, Texas and Kentucky and other States has been sufficient to indicate the potentialities of these States in this respect.

West Virginia is making progress in iron and steel manufacture, and the utilization of its natural gas has given a marked impetus to glassmaking within the State, with Ohio and Pennsylvania drawing upon it freely for that fuel. This gas is but one of the several sources of industrial power in the South yet to be developed to their full extent. In the Piedmont section are many streams to be brought under man's dominion and used in the generation of electrical energy. The coal deposits have established their reputation for quantity and quality at home and abroad. The production of illuminant petroleum is passing from the old New York-Pennsylvania centers into West Virginia, Kentucky and Tennessee, and to its growing production at Corsicana, Texas, has been added the enormous gushing of the oil of fuel grade at Beaumont, not far from the Gulf coast.

Other mineral supplies have been touched. Advanced methods of obtaining gold have been fixed in Georgia and the Carolinas. It has been found more profitable in Virginia to mine 500 or 600 feet deep through and for pyrites than to manipulate the gold-bearing quartz nearer the surface. In the Virgilina belt of Virginia and North Carolina and around Ducktown, Tenn., the copper ores are being uncovered, and the lead and zinc fields of Kentucky have been entered, though not to the extent of those of the Joplin district. Arkansas is preparing to exploit these minerals, and Texas is largely an undiscovered country. To the phosphates of South Carolina and Florida have been added the immense deposits of Tennessee. Georgia and Tennessee marbles are being used in buildings in many widely-separated cities of the country.

Mining of rock-salt from beds of an undetermined depth in the mounds of the Louisiana coast, and the manufacture of salt by evaporation in Texas and in Virginia and West Virginia, carrying the mind back to the hint of 1797 given by the elk, buffalo and deer at the salt licks of the Kanawha, should not be forgotten. Then there are the great tobacco establishments in half a dozen States, with Sumatra-wrapper leaf and Cuban-filler leaf grown successfully in Florida; the tanneries and paper-pulp mills, the sugar mills, the rice mills, the grist

and flour mills, the last-named increasing in number with the encouraging, practical agitation for wheat-growing centered in Georgia; the railroad shops and the fertilizer works, one of the great corporations of the kind in the country having its birthplace in Virginia.

It was quite significant that in excavating for the foundation of a cotton mill in Alabama four or five years ago a vein of bituminous coal was struck. There is no place outside the South where cotton may be seen growing above beds of coal and iron. There is no other place where above a variety of practically exhaustless minerals tower such vast stretches of forest trees. Inroads upon these have been made by the turpentine-worker, particularly on the South Atlantic coast, and the lumberman, slowly changing his base from the depleted regions of the North and Middle West. But while the South is cutting its timber upon a scale represented by the recent formation of a $10,000,000 lumber company in Texas, controlling 1,000,000 acres of long-leaf pine, it is also keeping pace with the diversification in the iron industry and with the more gradual extension of agricultural pursuits to the growing of apples and peaches, oranges and pineapples, berries and other small fruit, and the widening area of truck-farming, in building up such industries as the cedar works at Richmond, the furniture factories at High Point and other North Carolina towns, the variety of woodworking plants in half a dozen States from Virginia to Texas, and carriage or wagon works in such places as Chattanooga, Nashville and Atlanta. Georgetown, S. C.; Brunswick, Ga.; Pensacola, Fla.; Mobile, Ala.; Memphis, Tenn.; New Orleans, La.; Beaumont, Texas, and Norfolk, Va., have a world-standing in the lumber trade.

To reach the uncut forests thousands of miles of railroads have been built and operated by lumber companies, and several thousands of this mileage have become merged in lines doing a regular freight and passenger business, or have been in the van of new roads into rich but undeveloped territory for agriculture, mining, lumbering or manufacturing. In twenty years the railroad mileage of the South has more than doubled, and is now several thousand miles greater than the total mileage of the country in 1860. During the past ten years the Southern mileage has increased at a greater rate than that in the rest of the United States, and this increase has been but a part of the widespread work of consolidating incompleted and incompetent lines into healthy, vigorous systems, operated upon most approved financial principles.

With all that has been done by the railroads in opening up and aiding materially in the development of many resources of the interior, a notable part of work has been done in improving terminal facilities, notably at Baltimore, Newport News, Norfolk, Savannah, Fernandina, Brunswick, Pensacola, Jacksonville, Tampa, Mobile, New Orleans, Port Arthur, Sabine Pass and Galveston. Since 1880 between $10,000,000 and $12,000,000 have been spent in such improvements. To them must be credited much of the direction of the flow of the products of the Middle West and Northwest toward the Southern ports that was diverted from its natural course when New York tapped the West in 1825 with its Erie canal. Maryland and Virginia with their canals, South Carolina and Alabama with their projected railroads, and Louisiana with its steamboats attempted with but mediocre success to overcome this influence, which was mighty in giving New York its pre-eminence in commerce. The completion of trunk lines has restored the balance and fulfilled the hopes of Southerners that lines of fast-traveling steamships would connect the Gulf and South Atlantic ports with foreign lands. Hampton Roads has become the reality of the dreams of Mann and Maury. The South, with its cotton and cotton goods, its cottonseed oil and cotton cake, its lumber and naval stores, its pig-iron and phosphates, its locomotives and steamboats, and now with its constantly-increasing volume of oil, is contributing annually more than a third of the products exported from the United States. It is handling at its own ports a greater and greater proportion of American commerce. In 1892 the value of exports and imports of the United States outside of the South was $1,440,657,134, and at Southern ports $417,003,473. In 1901 Southern ports handled $586,196,124 worth of commerce, and all other ports $1,724,232,449. The increase in the ten years was 40.57 per cent. at Southern ports, and but 19.68 per cent. at all other ports.

This is but a brief sketch of notable advances made by the South in a quarter of a century. They are tokens that the South is making good its promises.

That the value of manufactured products at the South increased between 1890 and 1900 from $917,229,027 to $1,466,669,495, or $549,440,468, equal to 59.9 per cent., and that capital invested in manufactures increased $494,874,237, from $658,795,860 to $1,153,670,097, equal to 75.1 per cent., shows that at last the South, industrially, is keeping pace with the rest of the country, if, indeed, it be not moving just a bit more rapidly.

But the facts that a billion and a half of Southern products are hardly a ninth of the manufactured products of the United States, and that at least one State dependent upon the South and other sections for its raw material manufactures as much as the South, direct attention to the necessity for the South, with its unsurpassed natural advantages, to bestir itself to even greater things.

Many of its drawbacks have been removed. Increasing investments of home and outside capital since the war have given greater opportunity for the employment of blacks and whites. The wonderful upbuilding of the cotton-manufacturing industry has been a godsend for thousands of whites, and, in many cases, the first indication that the impediments of the earlier economic status had been removed for them, enabling them to take the first steps toward occupation on productive lines and away from a half-hearted struggle for mere existence. In eagerly grasping the chance they have displayed the same traits as the sons of the plantation who at home and abroad have become leaders in finance, transportation and manufacturing.

Those blacks who have escaped the baleful effects of false education and false philanthropy still cling to agriculture, as is natural, following the movement of the center of cotton production to the trans-Mississippi and lower Gulf regions. But in increasing numbers they have found work in the basic operations of the iron industry, in lumbering, in railroad construction, and, in fact, in all the energies which are carrying the South beyond the plowshare stage.

Diversification in agriculture and in manufacturing, the patent benefits of railroad construction, and the more frequent appearance of the additions to lines of transatlantic steamers at Southern ports are leading to diversification of public opinion, and are working toward a condition quite similar to that of a hundred years ago, when the South's mind was the country's mind in all matters pertaining to national development.

Through great tribulations the South has reached its present vantage-ground. But those tribulations were not without compensation. While the South lay fallow for fifteen or twenty years the rest of the country was obliged to face new problems born of the industrial age, and, under the stress of competition, to consign to the scrap-pile mass after mass of valuable machinery and valuable thought. Much of this unavoidable waste the South escaped. Its cotton manufacturers have, in the main, not been obliged to consider in their enterprises the important item of the substitution of new machinery for old. They have been able to install the latest and most improved. Railroad operations have had the advantage of well-wrought-out experiments elsewhere without their expense. The industrial world has been free, to a great extent, from the ills born of an infusion in other sections of un-American elements. The mass of Southern white labor is of the same stock as the Southern employing class. The Southern blacks have never been prone to commit themselves spontaneously to labor policies menacing their own welfare.

Enjoying the ripe fruit of experience in other sections, and avoiding the mistakes which have necessarily been made there, the South may, under the constantly-accelerated impetus of this age of invention and machinery, again reach the place of relative importance it held at the birth of the republic.

Edward Atkinson

CRITICISM FROM A FRIENDLY SOURCE

By F. B. THURBER

President of the U. S. Export Association

You state that twenty years ago in February the Manufacturers' Record was established as an exponent and advocate of the industrial interests of the South, and ask a few words from me, as a Northern man who has had large business relations with the South, expressing my opinion of the South and its future. I am glad to do this for a journal which has done so much for the development of the South, and, indeed, of our whole country.

Dating from immediately after the war, I have done business with the merchants of every Southern State. My old firm of H. K. & F. B. Thurber & Co. and their successors kept a record by States of our losses by bad debts. We sold goods in every State and Territory in the Union, and for five years immediately succeeding the close of the war, while the South was impoverished and less able to pay its debts than any other section of our country, our percentage of losses in the South, as a whole, compared favorably with any other section, and the State of South Carolina held the record for the least percentage of losses of any State in the Union. This speaks volumes for the honor of the business men of the South. Other classes in the community may be as honest, but they have certainly not been as intelligent. They have allowed politicians to play upon their prejudices, and they have enacted laws which, compared with those of other States, terrorize capital, and whatever progress the South has made in the last twenty years is due to its great resources in fields, forests, mines, and more recently in factories, and not to intelligent legislation.

Politically, the South has been governed by old traditions and shibboleths. The republican party in the North has been unwise to mix up with the race question, which is absolutely paramount in the South, and this has made a solid democratic South, with traditions against the doctrine of protection to American industries, with traditions against subsidies, and with prejudices against the combination of capital, which the organization of industry in this age of steam, electricty and machinery has compelled. The anti-trust laws of Texas and some other Southern States, executed by law officers who share in the penalties of their infringement; the attitude of most of the Southern States towards the railroads (which, perhaps, more than any other element have aided in their development)—hostile alike in legislation, taxation and the jury-box—has retarded the development of the South and largely nullified the great natural advantages that she possesses. It may be that, as you wrote me a few years ago, "this element is passing away," but we have had enough recent illustrations of the existence of this unintelligent, agrarian spirit to deter the investment of capital in the South, which her business interests would gladly invite.

If the people of the North and West could feel that these elements existed in the South to the same extent that they do in the North and West, the South from this time forward would develop faster than any other section of our country.

Her advantages in soil and climate, to say nothing of her other great resources, would make her the richest country on the face of the earth. When the mass of the people of the South learn to appreciate that the word "corporation" simply means *co-operation;* that this is an age of organization, and support their business men in their efforts to keep step to the music of the times, then the South will progress faster than any other section of our common country, and no one will be more glad than myself to welcome that time.

Coal Production Measuring Southern Advance

By EDWARD WHEELER PARKER

Managing Editor Engineering and Mining Journal

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The history of the South's industrial awakening is written in the statistics of her coal production. This history is one without a parallel. Twenty-five years ago the territory lying south of the Mason and Dixon line and the Ohio river was still prostrate from the effects of one of the most devastating wars on record. The population was dependent for its existence upon the products of the soil, and the principal industries were the cultivation of corn, cotton and tobacco, and the cutting, in comparatively limited quantities, of yellow-pine lumber. Mining of any kind, with the exception of coal in the Piedmont-Cumberland region, was of no importance, nor was there any capital available for the development of the resources hidden below the surface of the ground. The "immigrants" from the North who flocked to the South just after the war partook more of the nature of carrion birds than of helpful citizens, and retarded rather than encouraged the resuscitation of the region. In 1870, outside of the Piedmont-Cumberland region, the only coal produced in the Southern States was a small amount (13,200 short tons) in Alabama, except for a possible small local output in Kentucky and Tennessee, used for home consumption and unrecorded. The total coal product of the Southern States in that year, so far as we have any records, was a little over 2,000,000 tons, which was less than 6 per cent. of the total coal product of the United States. The population of the entire Southern States in that year was 12,298,020, so that the coal product represented an output of one ton of coal to each six persons.

EDWARD WHEELER PARKER.

During the next five years the first signs of the awakening were observed. Tennessee and Kentucky were both added to the list of coal-producing States in 1873, and in the same year West Virginia contributed to the product from the counties in the southern part of the State, and which have since developed into some of the most important coal-producing districts in the United States. By 1875 the total production of the Southern States (the product in this year coming from Alabama, Kentucky, Maryland, Tennessee and West Virginia) amounted to 4,600,000 short tons, or 8.8 per cent. of the entire product of the United States.

It was not until five years later, in 1880, that any other States were added to the coal-producing list in the South. In that year Arkansas was reported by the tenth United States census as producing 14,478 tons, and Virginia was credited with an output of 112,000 tons. The other States, with the exception of Maryland, had somewhat increased their production during the five years from 1875 to 1880, and the total output amounted to 6,034,257 short tons. During this period, however, the production in the Southern States had not quite kept pace with that of other coal-producing sections, as the percentage to the total United States product in 1880 was slightly less than in 1875, having fallen from 8.8 to 8.4. As the population of the Southern States in 1880 amounted to 16,516,568 persons, the coal produced in that year was one ton for each twenty-seven persons.

The great revival of the Southern States really began in the decade from 1880 to 1890. It was during this period that the sensational "boom" which developed Birmingham and its iron industries in Alabama occurred. Coal production in Alabama began in earnest, and by 1884 had reached a total of nearly 2,500,000, nearly seven times the product of 1880. Georgia and the Indian Territory entered the field as coal producers, and general activity prevailed throughout the older States. West Virginia doubled her production, and Virginia's output increased fivefold. A reaction in Alabama had reduced her production in 1885 nearly 700,000 tons as compared with the preceding year, but as compared with 1880 the output in 1885 represented a multiple of 4.7. The total production of the Southern States in 1885 amounted to 12,360,356 short tons, more than double that of five years before. This output was equal to 11 per cent. of the total product of the United States. Another 10,000,000 tons were added to the South's coal production in the next five years, the total tonnage for 1890 aggregating 22,170,124 short tons, or 14 per cent. of the country's total. The eleventh United States census reported the population for the Southern States in 1890 at 19,830,813, so that the coal production now amounted to 1.12 tons per capita.

The South naturally shared in the depression which prevailed during the first half of the last decade of the closing century, and while the coal production increased somewhat from 1890 to 1895, the increase was not as large in amount as was shown from 1885 to 1890, nor as much in proportion as during any other portion of the period covered by this review. The records show, however, that the effects of the depression were less in evidence among the Southern States than in any other portion of the country. The coal production in the South continued to increase during most of the period, and in 1895 the product was 8,669,000 tons larger than in 1890, an increase of nearly 40 per cent., whereas the total increase for the United States was, in round numbers, 35,350,000 tons, or 22.4 per cent. The increase in the production in the United States, exclusive of the Southern States, was less than 20 per cent.

But if there was a falling off in the ratio of increase from 1890 to 1895, as compared with preceding years, it was more than made up by the five years of plenty which marked the closing of the nineteenth century. From less than 31,000,000 tons in 1895 the coal product of the Southern States increased with each year, until in 1900 it reached a total of 51,169,417 short tons. The population in the ten years from 1890 to 1900 had increased to 24,523,527, the coal product representing a per capita output of 2.09, as compared with .16½ in 1870.

The actual increase in 1900 over 1895 was 20,329,994 short tons, or 66 per cent. The production in 1900 was 2.3 times that of 1890, more than eight times that of 1880, and more than twenty-five times that of 1870. It was equal to 20 per cent. of the total product of Great Britain, more than one-third that of Germany, and exceeded that of any other European country outside of these two. The principal coal-producing countries outside of the United States, Great Britain and Germany are Austria-Hungary, France, Belgium and Russia. How the coal production of these four countries compared with that of the Southern States in 1880, 1890 and 1900 is shown in the following table:

PRODUCTION OF COAL IN SOUTHERN STATES COMPARED WITH AUSTRIA-HUNGARY, FRANCE, BELGIUM AND RUSSIA.

	1880. Short tons.	1890. Short tons.	1900. Short tons.
Southern States	6,034,257	22,170,124	51,169,417
Austria-Hungary	16,317,000	30,323,195	45,000,000
France	21,346,124	28,756,638	36,663,550
Belgium	18,617,585	22,453,471	25,733,901
Russia	3,570,413	6,633,219	17,510,780

In 1880 the Southern States produced about 1.6 per cent. of the world's total coal output. In 1890 they contributed something over 6 per cent.

Production by States.

In the following table is shown the coal production in the Southern States in 1870, 1875, 1880, 1885, 1890 and 1900. The figures are taken from the annual statistical volume, "Mineral Resources of the United States," published by the United States Geological Survey:

PRODUCTION OF COAL IN THE SOUTHERN STATES, 1870-1900.

	1870.	1875.	1880.	1885.	1890.	1895.	1900.
Alabama	13,200	67,200	380,800	1,800,000	4,090,409	5,693,775	8,394,273
Arkansas	.....	.....	14,478	100,000	399,888	598,322	1,447,045
Georgia	.....	.....	.....	150,000	228,337	260,998	315,537
Indian Territory	.....	.....	.....	500,000	869,229	1,211,185	1,922,288
Kentucky	.....	500,000	1,000,000	1,600,000	2,701,496	3,557,770	5,328,964
Maryland	[1]2,023,123	2,552,744	2,317,937	2,833,337	3,357,813	3,915,585	4,024,688
North Carolina	.....	.....	.....	.....	10,262	24,900	17,734
Tennessee	.....	360,000	611,042	1,440,957	2,169,585	2,535,644	3,708,562
Texas	.....	.....	.....	.....	184,440	484,959	968,573
Virginia	.....	.....	112,000	567,000	784,011	1,368,324	2,393,754
West Virginia	.....	1,112,000	1,568,000	3,369,062	7,394,654	11,387,961	22,647,267
Total	2,036,323	4,599,944	6,034,257	12,360,356	22,170,124	30,839,423	51,169,417

[1]Includes Piedmont region of West Virginia.

As shown by the above table, West Virginia, which in 1870 produced a comparatively small amount in the Piedmont region, now stands first among the coal producers of the Southern States. Moreover, this State ranks third among all the coal-producing States in the country, being outranked by Pennsylvania and Illinois only, and is destined within the next five years to take precedence over Illinois. West Virginia produced in 1900 about 40 per cent. of the total coal product of the South. Alabama comes second among the Southern coal producers, but right here should be noted an essential difference between the dispositions of the coal product of West Virginia and Alabama.

Excluding that portion of the product which is used for railroad locomotives and a comparatively insignificant amount consumed in the iron and steel works at Wheeling, nearly all of the West Virginia coal, or the coke made from it, is shipped outside of the State, and goes to the support of manufacturing industries in other States. The valuable coking-coal areas of West Virginia were opened up after the iron and other metallurgical and manufacturing centers had been established in States to which the West Virginia coals and cokes could be profitably shipped, and there seems to have been little encouragement given to the few attempts that have been made to build up manufacturing enterprises within the State. There is little doubt but that the State has been a comparative loser because of this condition. It is a generally accepted proposition that the country which exports its raw material instead of finished products is not keeping up with the procession, and is, relatively speaking, indulging in a "retrograde movement." The same may be said of a State as well as of a nation, and West Virginia in this respect cannot be an exception. The railroads, without intending any harm, have been largely responsible for this in their desire to secure long hauls for a profitable freight. An entirely different condition prevails in Alabama. The development of her iron-mining and iron-making industries was co-ordinate with that of her coal-mining development. The export trade in Alabama coal becomes of small importance when compared to that consumed in her self-sustaining mills. Employment is thereby given to a more desirable class of labor, permanent communities are established, and the value of the finished products largely exceeds those of West Virginia. Alabama produced in 1900 1,184,337 long tons of pig-iron, valued at $22,324,752; West Virginia made 166,758 tons, worth $3,143,388. West Virginia is credited with a product of petroleum in 1900 whose value was nearly $22,000,000, while Alabama had none. Excluding this factor, the value of West Virginia's mineral product in 1900 was about $32,500,000, while that of Alabama was worth $41,665,000, notwithstanding the fact that Alabama's coal product was only a little more than one-third that of West Virginia. Alabama coal is for the greater part inferior to that produced in West Virginia, and yet the average value per ton of Alabama's product (consumed at home) was $1.17, whereas West Virginia's exported

superior coal brought only eighty-one cents. The year before, the average price for Alabama coal was $1.09, as compared with sixty-three cents obtained in West Virginia. Alabama's coke output, consumed in local furnaces, in 1900 amounted to 2,110,837 short tons, and was worth $5,629,423. West Virginia's product, 10 per cent. larger (2,358,499 short tons), shipped out of the State, was worth at the ovens $4,746,633. Would it not pay the coal producers of West Virginia to consider more carefully the matter of building up a local market? They have been in the habit of priding themselves upon the demand for West Virginia coal in foreign markets, but is it profitable?

The third among the Southern States in point of coal production is Kentucky. This is the only one of the United States which draws its coal supply from any two of the great fields. The eastern part of the State lies within the borders of the Appalachian coal field, while the southern extremity of the Illinois-Indiana fields is found within Kentucky's boundaries. The first records of a commercial product from this State are for 1873, when 300,000 tons were produced. With only one or two unimportant exceptions, the production has increased steadily, until in 1900 it reached a total of 5,328,964 short tons. A small part of the product, principally slack, is made into coke and consumed in blast furnaces, but most of the coal is consumed for locomotive and domestic use. What is known as "Jellico" coal, produced in Bell and Whitley counties, and in Anderson and Campbell counties, in Tennessee, has an excellent reputation as a steam coal, and is shipped in some quantities to Charleston, Savannah and Brunswick for bunker coal. About 40 per cent. of the total product comes from the eastern counties of the State, while the western counties produce about 60 per cent. Nearly all of the coke is made in the western part of the State.

Maryland, which now ranks fourth as a coal producer among the Southern States, was in 1870 practically the chief source of supply. The construction of the Chesapeake & Ohio canal and of the Baltimore & Ohio Railroad brought the Maryland fields into prominence nearly sixty years ago. The first shipments were made over the Baltimore & Ohio Railroad in 1842, and by the Chesapeake & Ohio canal in 1850. "Cumberland" coal has a reputation second to none as a steam producer, and the best blacksmith coal produced in the United States is that obtained in Maryland and from the adjacent counties in West Virginia. Maryland is the only one of the Southern States in which the coal-mining industry may be said to have reached the age of fifty years. This statement may be qualified somewhat by the fact that coal was mined in what is known as the Richmond basin early in the last century, and this region has continued to produce small amounts of coal at one time or another up to the present. Coal-mining in the Richmond basin (embracing Henrico and Chesterfield counties, Virginia) has, however, during the last twenty-five years hardly risen to the dignity of an "industry," and the records of its earlier production are so incomplete that it may easily be omitted from a discussion of the subject.

The coal-mining industry of the Southern States really began with the opening of the Cumberland region in 1842. From that date until 1853 Maryland, so far as we know, was the only one of the States south of the Mason and Dixon line in which coal was mined for market. The Piedmont region of West Virginia was opened up in 1853, and for the next seventeen years that State shared the exclusive honors with her sister on the north side of the Potomac river. Beginning in 1842, the Maryland-West Virginia production grew, until in 1870 it exceeded 2,000,000 tons. When this field was opened up, coal-mining was of little importance anywhere in the United States. The anthracite fields of Pennsylvania, which began shipping coal in 1820, had at this time attained a yearly output of only a little over 1,000,000 tons, and its bituminous region had not really been touched.

The coal production from the Cumberland-Piedmont region during each five years from 1845 to 1865 was as follows. The output since 1865 has already been shown in a preceding table:

PRODUCTION OF MARYLAND-WEST VIRGINIA COAL FIELD, 1845-1865.

	Short tons.		Short tons.
1845	27,500	1860	885,000
1850	320,500	1865	1,012,000
1855	725,000		

It is not probable that Maryland's coal output will show any more of an increase in the future than it has in the past, and we may rather expect to see the production decline. The coal area of Maryland is limited in extent, and is thoroughly developed. It will probably not be very long before the production will begin to show an annual decrease. West Virginia, on the other hand, will continue to increase rapidly, and the production for 1901 will probably reach 27,000,000 tons. Virginia's coal product in 1901 will reach, approximately, 2,600,000 tons. The production from Georgia is obtained from two counties, Dade and Walker, in the extreme northwestern portion of the State, these two counties being underlain by a portion of the extension of the Warrior coal bed of Alabama. The production of this State for 1901 will probably amount to about 400,000 tons. The mine inspector of Alabama estimates the production of that State for 1901 at about 9,000,000 tons, an increase of 600,000 tons, or 7.5 per cent., over 1900. Tennessee's output for 1901 will show about a 10 per cent. increase over that of the preceding year, and reach, for the first time in its history, a total of 4,000,000 tons. Kentucky's product will approach 6,000,000 tons. The largest percentage of increase of any of the Southern States in 1901 was made in Arkansas and the Indian Territory, where the greatest activity prevailed during the entire year. Prominent producers in the region estimate that the product for 1901 will exceed that of the preceding year by from 50 to 75 per cent., so that the output in Arkansas will amount to between 2,000,000 and 2,500,000 tons, and that of the Indian Territory is expected to exceed 3,000,000 tons. The activity in Arkansas was shared in great part by the coal producers in the Indian Territory, and the production for last year of that Territory will amount to about 2,500,000 tons. The exact extent to which the oil developments of Beaumont have affected the coal production in Texas cannot at present be determined. It is probable, however, that while the present year, 1902, will show a decreased coal product in Texas, particularly in the lignite area, the production in 1901 will show about the same as that for the preceding year.

Development of the Mineral Resources of the South

By DAVID T. DAY

United States Geological Survey

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In an effort to review the development of the South's mineral resources it is difficult to point out any line by which to define the South. This embarrassment increases every year. The exigencies of trade are obliterating any such line. The mutual dependence of different parts of the country upon each other in developing any branch of the mineral industry makes it difficult to consider any industry as distinctly sectional, as one essential feature of the industry comes from one State, while an equally important factor will be drawn from some far-distant region, and there is nothing more dependent upon trade and less upon the original locality than the resultant product, which finds its market entirely independent of original sources.

DAVID T. DAY.

The examples illustrating the truth of this are too well known to need special attention. The barytes industry will suffice, part of the supply of which is mined in Missouri and more in various Southern States, so that the finished article which reaches the consumer from the neighborhood of Lynchburg, Va., is already indistinguishable as to its original source.

Nevertheless, it is necessary for the purposes of a review to define the section which we propose to include, nor is there anything more than justice in so drawing a line as will expose clearly to view the peculiar natural features of a section, and thereby draw attention to it in so far as its distinctive features may thus be made clear and may interest the further development of capital.

The lines between the North and the South which have shown themselves unnecessary to the present conditions have been artificial lines, and with the increasing obscurity of the old Mason and Dixon's line in the minds of modern students, it is well to replace it by another more or less parallel *natural* line. The only valuable Mason and Dixon's line must be sought in geology. We must go back for its origin to the glacial epoch. The enormous field of ice which characterized this epoch carried with it stones, pebbles and silt, which were left on its edge to mark the southern limit of its encroachment, and this irregular line of glacial detritus, which is now only the harmless border line of a climatic conflict of long ago, becomes the most useful Mason and Dixon's line for distinguishing the South's mineral resources from those of the North. This great glacial action sharply characterized the two regions. Above this line the glaciers planed the rocks bare of the coverings of clays of all sorts, carried these decomposition products of the old rocks into irregular cavities, and so mixed and distributed them as to leave them without any connection between the resultant deposits and the original sources. In many cases this action of cleaning the rocks of the decayed products above them has laid bare valuable stores of mineral wealth which would otherwise have remained hidden. In many cases it has also scraped away large stores of valuable clays, and in transporting them hopelessly mixed them with worthless constituents. Below the line, on the other hand, the gradual decay of the old rock surfaces has gone on in place. One result of inestimable value is that these decomposition products, namely, enormous banks of clays of all kinds, have been left unmixed with each other and each with its own characteristics, according to the rock from which it was derived. Still more important for the usefulness of the clays is the fact that where they have been formed from decomposition of rocks on steep slopes or at high altitudes, the erosion has taken place by water currents, and not by glaciers. The water currents uniformly help in sorting the constituents of the clay, bringing together large masses of uniform composition, while the glacier does nothing but mix, to the detriment of the product. On the other hand, it is difficult to foretell how many thousands of valuable mineral deposits still remain under this mantle of decomposed rock material hidden away from easy prospecting, and only to be found by far more refined methods than are available at present, and after the knowledge of the ocurrence of mineral deposits has become far more exact from geological study.

Perhaps the significance of our geological line will be apparent by simply considering the development which has already taken place in the clay industries of the Southern States. Especially do we appreciate that not 1 per cent. of the South's great stores of clay products has yet been developed. The writer has in mind a mental photograph of entire hills of good, fairly pure kaolin associated in the same locality in Georgia with clays of different type equal almost in amount to the entire clay product of the United States, and still the only notice of the existence of these deposits has only lately been published in the valuable reports of Georgia's State geologist.

The clay products of the United States are greater in value than either gold or silver, and certainly the South's greatest product in value, and also most widely distributed over the entire area, is her clay. Slight as have been the developments of the clay industry of the South in comparison of what it is capable of, we can measure the possibilities of the future by considering that the number of clayworking establishments in the whole South up to January 1, 1901, was 2140, consisting of 1740 brick and tile works, 242 potteries and 158 establishments for the sale of raw kaolin and other clays.

Ten potteries, with a total capacity for producing $500,000 worth of products annually, were added in 1901; three new establishments were equipped for sending raw clays to other parts of the country for manufacture into fine pottery, and, greatest of all, 173 new establishments for making common, pressed and vitrified brick, and tile and sewer pipe were added during the year, with sufficient capacity to produce 3,000,000 brick annually.

CLAY-WORKING ESTABLISHMENTS IN THE SOUTHERN STATES, 1901.

States.	Brick and Tile. No. of producers.	Brick and Tile. New firms during year.	Pottery. No. of producers.	Pottery. New firms during year.	Clay Miners. No. of producers.	Clay Miners. New firms during year.
Alabama	120	16	29	1	13	..
Arkansas	91	10	8	1	..	..
Florida	34	8	1	..	8	..
Georgia	114	19	33	3	20	1
Kentucky	131	7	13	..	9	..
Louisiana	74	6	4	1	..	..
Maryland	104	5	10	..	19	..
Mississippi	100	10	10	..	..	..
Missouri	300	18	22	..	39	..
North Carolina	287	18	48	2	30	..
South Carolina	119	13	17	..	13	1
Tennessee	149	10	22	..	26	..
Texas	231	19	23	2	8	1
Virginia	130	11	9	..	5	..
West Virginia	56	3	9	..	7	..
Total	2,040	173	264	10	197	3

The development of the coal industry has been most satisfactory, especially in West Virginia, where the product is greater than that of Ohio, and fast approaching Illinois. In fact, Illinois and Pennsylvania are the only States where the coal product is greater than in West Virginia.

NUMBER OF COAL OPERATORS IN THE SOUTHERN STATES IN 1900 AND 1901, WITH INCREASE AND PER CENT. OF INCREASE.

States.	1900.	1901.	Increase.	Per cent. of increase.
Alabama	86	104	18	20.9
Arkansas	24	30	6	25.0
Georgia	3	3	...	...
Kentucky	113	123	10	8.8
Maryland	27	30	3	11.1
Missouri	162	194	32	19.8
North Carolina	3	3	...	...
Tennessee	70	90	20	28.6
Texas	30	31	1	3.3
Virginia	28	31	3	10.7
West Virginia	260	317	57	22.0
Total	806	956	150	18.6

The condition of the South's iron industries is far more satisfactory than ever before. The great prosperity of the year 1900 gave the opportunity for strengthening the industry everywhere, and this was especially evident in the Birmingham district. During the year the consolidation of many small plants and the removal of isolated furnaces to better locations has done much to establish prosperity for future years.

The Southern iron district was the gainer also by an increased demand for all classes of iron, due to the great strike among the Northern iron-workers. This domestic demand offset the decrease of 200,000 tons in exports. But one of the most significant features for the whole South, not only for the iron trade, but for industrial development in many lines, is the establishment on a secure basis of steel manufacture. Nothing has been so earnestly urged by such eminent economists as Mr. James M. Swank as the advantage to the South in establishing the manufacture of all manner of implements from its own iron product, and now the opportunity is furnished by the manufacture of open-hearth steel, an industry which has crept slowly along through the experimental stages, and now becomes a vital factor in the South's progress, and one which will cause the date "1902" to be placed on many a factory tributary to steel manufacture. In evidence of this is the increased product of basic pig-iron, and also the important construction at Ensley, Ala., of a large plant of Semet-Solvay by-product coke ovens, and, without doubt, there are other large steel plants to follow under the management of the Sloss-Sheffield and Republic iron and steel companies.

In the consumption of steel, railroad extension in the South is interesting, since Texas led all the States of the Union, with a total of 537 miles.

Among the other metal industries the development of the copper deposit at Virgilina, Va., has been satisfactory, and the exploitation of this deposit will lead to the successful working of others, such as Ore Knob, N. C.

More careful and intelligent exploitation has kept the manganese deposits of Cartersville, Ga., the chief source of supply for this metal, and also, as with copper, developed valuable information as to the best means of making these irregular ore bodies permanent sources of profit.

While speaking of the metals attention should be directed to the great advance in lead and zinc mining in Southwest Missouri and in adjoining States, and especially to the new impetus to lead-mining in Southeastern Missouri, where the Central and Federal lead companies and the Doe Run properties are making this region one of great activity, with arrangements for a greatly increased product for 1902.

All of these metalliferous deposits require comparatively long time for proper development work, and it is interesting to note that the quicksilver deposits of Texas have already reached the productive stage in the Terlingua district, with 3000 flasks a year as the present capacity, and probably a much greater product in the near future. Many of the claims had accumulated considerable ore piles in the progress of development work, and this accumulation, together with the ore from larger mines, demanded furnaces of modern type. The Marfa & Mariposa Co. has begun operating on a ten-ton Scott & Huttner furnace. The Terlingua Mining Co. is building another larger furnace. The difficulty of keepng up the needed supply of quicksilver from the California and Oregon mines makes the product from Texas very significant.

Among the non-metallic minerals the phosphate industry has a prominent place as a distinctly Southern product. The Florida trade enjoyed a prosperous year, especially in the hard-rock district. No significant new deposit was discovered, but the old sources were as productive as ever. There was a revival of interest in the South Carolina deposits, and in Tennessee the commercial situation was strengthened by a combination of the principal producers in the Maury county district.

The bauxite industry increased its product in the Arkansas field. The supply of fuller's earth was abundant from the developed deposits at Quincy, Fla., and new deposits of good grade are being uncovered rapidly. This is especially true of a new deposit in South Georgia and another near Sumter, S. C.

Cheap fuel developments in Louisiana bring up the question of utilizing the enormous stores of rock-salt and the less considerable but important sulphur beds in that State as the basis of chemical factories for the production of soda, sulphuric acid and other heavy chemicals and fertilizers. There is no overestimating the advantage of such an enterprise, and what is most satisfactory is the great probability that it will be carried out.

One of the greatest milestones of advance in the history of the South was the recognition by the State of Texas of the new order of things by the establishment in last May of the Mineral Survey of Texas, with Dr. William B. Phillips at its head. The need of such an institution in Texas is best shown by the rapidity with which the survey has developed under the leadership of such a thoroughly-equipped expert as Dr. Phillips. Established in May, the first bulletin of progress was prepared, published and distributed in September.

Among the mineral developments of the South the petroleum developments of Texas stand out as the greatest contribution to the South's mineral wealth which has been made since the development of the coal and iron deposits of Alabama and Tennessee, and with the great probability that it will rank first in importance among all the South's mineral assets. This is true not only so much on account of the amount of money for which the oil may be sold, but on account of its enormous effect in developing other Southern industries. The drilling of the first spouting oil well by Capt. A. F. Lucas at Beaumont, Texas, was completed only a year ago, and yet the importance of this new source of fuel is seriously felt even in the city of New York. Starting at this remote point in Texas, the importance of the discovery has spread over the whole South. In fact, we may note the results of this discovery on the mineral map much after the same fashion as we note on the weather map the influence of a point of high barometric pressure, with its progressive effect on the condition of the rest of the country. This wonderful natural gift to the wealth of Texas is a real gift, unsought by the people of the State.

There is no simple method of measuring the enormous importance of this oil discovery. It is most evident from the fact that the oil cannot be used in any way within the limits of the Southern States without contributing valuable aid to some other industry. Every pound of the oil which is burned in railroad engines contributes to the hauling of supplies of one sort or another, and at present practically all within this area. It is significant that the oil has already brought about the spectacular condition of a car famine in this part of the United States, requiring the most urgent search in all directions for tank cars and every other possible means of transporting this valuable commodity to points of consumption. The number of industries which languish in the Texas region for lack of cheap fuel is so great that the whole view of the industrial situation is changed. The commerce of Port Arthur and of other ports will be revolutionized, and the question of using this fuel for railroad engines and for many other economic purposes has extended into remote industrial centers, even as far north as New England. The question of oil for railroad fuel is being examined in Pennsylvania and New York. The result is simply an equation in price and convenience between coal from various sources and Texas petroleum. In competition with it the coal producer has already considered a proposition of converting coal into powder in order to feed it to railroad engines after the same more convenient fashion in which oil can be fed. This shows the importance of the movement.

One year has practically sufficed for abandoning all question as to whether the oil can be made suitable for fuel purposes. The oil contains more sulphur than that found in any considerable body of oil in the United States or elsewhere in the world. The storms of objections raised to this sulphur have already been shown to be foolish. To briefly summarize this feature, it is evident that without any expensive refining method the total amount of this sulphur can be reduced to about one-half of 1 per cent., and the guarantee to this effect can be furnished for steamer cargoes. Already one of the largest cargoes of petroleum that has ever left the United States has consisted of this Texas oil sent abroad, and important contracts for long-time deliveries have been made. While this involves the largest deliveries of Texas oil thus far accomplished, the movement is by no means so significant and by no means so satisfactory to the general community as the domestic consumption, though on a smaller scale, for what has been shipped has gone abroad at low prices and to contribute to foreign industries rather than to develop those of Texas, for which the greatest good can be accomplished.

The low price has not, however, been altogether a disadvantage. It has caused a wider spread of interest in the fuel than would have been possible in years without these low values. The price per barrel must in general be about one-fourth of the cost of a ton of coal. The value of the oil for fuel is well established. It should be borne in mind, however, that the problem of

securing from this oil the usual valuable products obtained from Ohio and Pennsylvania crudes is not a difficult one. The success of refining methods predicted by the writer last summer in the Engineering Magazine is coming nearer every day, and does not offer any exceptionally great difficulty. There are many lines in which this crude oil should extend into industries with even greater advantage than the oils from Ohio and Pennsylvania. For example, it should make better binding material in asphalt-paving construction than has ever been found before.

The question of the quantity of oil to be obtained in other districts under similar conditions to the supply at Beaumont is by far the most interesting among the many points of discussion concerning Texas oil. It is claimed, on the one hand, that the geological conditions productive of oil at Beaumont are extremely limited. On the other hand, it is far more probable that these geological conditions should be found repeated in many other localities in Texas, and it is to this end, namely, the discovery of similar conditions, that the United States Geological Survey will co-operate with the State to the greatest extent possible. Meanwhile the impetus given to the prospecting for possible oil fields has extended far and wide, not only into Louisiana and Florida, but it has added to the ability of the prospector to secure means for the development of oil wells in such far-distant localities as Wyoming and Montana. Luckily there is no prospect that with all these developments the oil from any part of the country will become a drug upon the market.

While the discovery of oil at Beaumont had the natural effect of stimulating the formation in the Southern States of new companies to bore for oil, there has been little or no increase in production except in Texas and West Virginia, but the active prospecting will likely have an important bearing on the 1902 production.

A special bill is to be presented to Congress allowing foreign vessels to engage for two years in transportation of oil between United States ports. If this bill is passed, it will greatly increase water shipments, for nearly all the tank steamers are of foreign register. At present the production is confined altogether to the facilities for transportation, and that condition is almost certain to continue during the whole of 1902.

The following table shows the number of new companies formed in the Southern States in 1901 which will drill or prospect for oil:

Alabama	43	Louisiana	80
Arkansas	20	Mississippi	11
Maryland	2	Tennessee	35
Florida	7	Texas	525
Georgia	6	Virginia	8
Kentucky	90	West Virginia	35

TOTAL VALUE OF THE MINERAL PRODUCTS IN THE SOUTH IN 1882, 1890 AND 1900 BY MINERALS.

Minerals.	1882.	1890.	1900.
Asbestos	$2,062	.....	$16,310
Barytes	36,636	$86,505	187,964
Cement	21,050	319,202	408,186
Clay products	1,500,000	12,338,106	15,662,380
Coal	5,937,255	20,487,919	47,347,866
Copper	401,890	44,500	768,078
Corundum	11,280	80,565	102,705
Fluorspar	8,000	.....	75,600
Fuller's earth	.....	.....	62,710
Gold	290,000	318,500	273,200
Gypsum	19,542	20,782	210,529
Iron	2,877,776	4,003,752	5,369,105
Lead	1,514,071	1,581,881	2,570,000
Manganese	96,935	189,986	98,465
Mica	61,675	70,000	69,151
Mineral paints	106,740	106,212	93,797
Mineral waters	.....	317,459	904,634
Natural gas	.....	45,900	3,173,611
Nickel and cobalt	9,960	150,384	15,534
Petroleum	213,397	659,607	22,818,108
Phosphate rock	1,992,462	3,213,795	5,354,748
Quicksilver	.....	.....	82,800
Salt	615,857	266,688	459,682
Silver	.....	396,669	632,888
Soapstone	5,810	42,250	269,451
Stone	1,394,429	6,216,546	6,276,179
Sulphur and pyrite	.....	110,000	524,072
Zinc	646,644	2,165,617	1,525,000
Total	$17,807,646	$52,232,825	$115,352,763

TOTAL VALUE OF THE MINERAL PRODUCTS IN THE SOUTH IN 1882, 1890 AND 1900 BY STATES.

States.	1882.	1890.	1900.
Alabama	$1,345,865	$6,906,439	$13,701,595
Arkansas	33,535	1,139,226	2,383,500
Florida	.....	464,706	3,326,517
Georgia	457,737	2,817,706	3,448,233
Kentucky	1,273,178	4,315,997	7,102,364
Louisiana	56,160	423,125	789,219
Mississippi	.....	300,959	621,985
Missouri	7,189,716	13,794,930	13,407,664
North Carolina	548,340	836,769	1,458,848
South Carolina	2,028,774	3,303,854	2,451,086
Tennessee	1,396,681	4,871,083	8,651,904
Texas	142,800	2,359,634	5,295,753
Virginia	1,348,195	3,274,178	5,658,801
West Virginia	1,986,665	8,433,219	47,055,384
Total	$17,807,646	$53,232,825	$115,352,763

Import of the Production of Southern Petroleum

By F. H. OLIPHANT

United States Geological Survey

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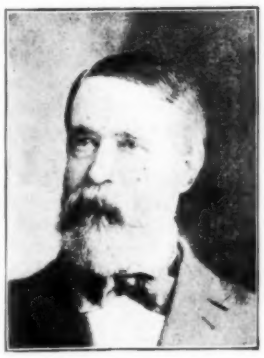
The discovery of the remarkably rich pool of asphaltic petroleum in the southeastern portion of Texas within the past year has caused a vastly increased interest as to the possibilities of the South and Southwest. These important developments have opened up to the operators of other sections the wonderful resources of the South and Southwest in the production of petroleum. A large amount of capital has been attracted by what has already been accomplished in these sections, and elsewhere throughout many of the Southern States the oil-prospector's drill has been active, seeking the liquid hydrocarbon which for forty years has added vast quantities of wealth to the United States, as well as supplying its people and that of many foreign nations with light, heat and other conveniences that were in the past unknown.



F. H. OLIPHANT.

The natural drift of new production from the older fields of Pennsylvania and New York has been to the Southwest and West. Year by year the production is becoming less in the older field, yet the deficiency is being more than made up by the new developments in these Southern directions. These recent discoveries have demonstrated that the great South and Southwest will furnish a much larger proportion of the world's supply of petroleum, developing a new factor that will in the near future have a wonderful and far-reaching effect upon their prosperity and progress.

The approximate production of petroleum in the United States for 1901 was 69,300,000 barrels, while that of 1900 was 63,382,416 barrels. This is a gain over the preceding year of nearly 6,000,000 barrels. The petroleum production for 1901 was the largest in the history of the petroleum industry. Nearly 41 per cent. of the total production came from States south of Mason and Dixon's line. The increase in the production of the Southern States over 1900 is about 8 per cent.

The following table gives a close approximation of the production of petroleum in the United States for 1901, in barrels:

New York and Pennsylvania	13,680,000
Ohio, Indiana and Wyoming	27,405,000
West Virginia	14,500,000
California	8,800,000
Texas	4,350,000
Colorado	300,000
Kentucky	128,000
Kansas	125,000
Tennessee	5,600
Indian Territory, Oklahoma and Missouri	6,400
Total	69,300,000

West Virginia.

This State produces more "white-sand petroleum" than any other in the United States—more by over 700,000 barrels than the combined production of Pennsylvania and New York. Few new fields were developed during the past year. The most promising development was an extension of what is known as the "Little Germany" district in Marshall county, in which a number of 100-barrel wells were secured. The indications seem to show that it will connect with the old Garner pool in Wetzel county. Some good wells were found in Gilmer and Calhoun counties. Yet there are several dry holes in evidence for each producer. Southwest of Mannington, near the Wetzel county line, a large well was brought in which produced 500 barrels per day when first opened up. Some wells have been drilled into the fifth sand in the old Fairview district that have produced forty to fifty barrels per day from that formation.

Some very remarkable gas wells were developed during the year in the Fink and Sand Fork districts. This State is fast becoming the source from which many of the surrounding States must depend for their supply in the future. Many millions of cubic feet of natural gas are now piped into Pennsylvania and Ohio to supply the failing gas fields in these States. The value of this product in 1900 was $3,000,000, while that for 1901 is estimated at fully $4,000,000. The amount of petroleum produced in 1901 was less than in 1900. The latter production will closely approximate 14,500,000 barrels, as compared with 16,195,675 barrels in 1900, a decrease of 1,700,000 barrels. The number of wells drilled is estimated to have been 2300, as compared with nearly 3000 in 1900. When it is remembered that these wells are, many of them, 2700 to 3000 feet in depth and cost on an average $4000 apiece, they represent an outlay of about $9,000,000.

In the following table is given the production of oil in West Virginia from the beginning of operations, so far as obtainable (that previous to 1877 being partially estimated), from 1876 to 1901:

PRODUCTION OF PETROLEUM IN WEST VIRGINIA.

Year.	Barrels.	Year.	Barrels.	Year.	Barrels.
Previous to 1876	3,000,000	1885	91,000	1895	8,129,125
1876	120,000	1886	102,000	1896	10,019,770
1877	172,000	1887	145,000	1897	13,090,045
1878	180,000	1888	119,448	1898	13,615,101
1879	180,000	1889	544,113	1899	13,910,630
1880	179,000	1890	492,578	1900	16,195,675
1881	151,000	1891	2,406,218	1901	14,500,000
1882	128,000	1892	3,810,086		
1883	126,000	1893	8,445,412	Total	118,510,825
1884	90,000	1894	8,577,624		

Texas.

By far the most important discovery of petroleum was unexpectedly made during the past year near Beaumont, Texas, early in January, when a purely experimental well developed a flow of petroleum at least four times greater

than any well heretofore found in the United States, crowding close up to some of the monsters developed at Baku, Russia. In all probability it would have equalled the biggest of them if the size of the casing had been ten inches instead of six. The third pay was found at 1050 feet. The strata penetrated was generally soft sand and clay, excepting towards the bottom, where a series of layers of calcite and limy concretions were encountered. As soon as the water-pressure was removed this well cleared itself, blowing out several hundred feet of four-inch tubing and volumes of sand and gravel. It shortly settled down to a steady flow, throwing the petroleum 100 feet above the top of the derrick through the six-inch tubing. It maintained a steady flow for nine consecutive days, when it was brought under control. Conservative estimates have put the production of this well at 75,000 barrels per day.

Nothing in the history of petroleum created so great an interest as this event, and not until it was shown that the quality of the petroleum was such that, for a time at least, it was not going to seriously affect the market for the higher grades did the producers in the old field have their fears quieted. Tl location of this gusher in a flat coastal plain, only twenty miles from tidewater, surrounded by many square miles of seemingly similar condition, was such as to create the impression that it was only necessary to drill to secure similar gushers.

This impression caused a vast number of companies to be organized by unscrupulous promoters, and a very large amount of stock was sold to innocent purchasers. The general opinion seemed to be that it was only necessary to find the petroleum to insure a fortune. Whether a profitable market could be secured or not was not considered at all.

It was soon demonstrated by the numerous dry holes drilled in all directions from the original well that the productive area at Beaumont was confined to an area on a slightly elevated, lenticular mound of about 120 acres known as Spindle Top Heights. Then there was a rush to secure territory inside the known area of production, and fabulous prices were paid for, in very many cases, as little as one-eighth of an acre.

At the close of the year there were 123 producing wells and fifty more drilling clustered on this mound. So many wells in so small an area have allowed the gas-pressure to escape, until the pressure of the column of water used in the artesian method of drilling is filling up the space above the petroleum horizon. This, in turn, must interfere with, if not prevent, the wells flowing anything like the volume they did at first, and in time prevent them flowing at all.

The business is assuming a more definite shape as the extent and character of the Beaumont petroleum field becomes more clearly recognized. The specific gravity of Beaumont petroleum at 60° F. is .910, equal to 23° when fresh from the wells. It flashes at 110°, Abel test; contains 11.03 per cent. of hydrogen, 85.66 per cent. of carbon and 3.31 per cent. of sulphur. The ultimate thermal equivalent is 19,047 B. T. H. U., equal to 15,000 efficient B. T. H. U. per pound of petroleum. Native sulphur was abundantly associated with the calcspar encountered just above the lower pay streak in the Lucas well.

So far in the territory outside of Spindle Top no gushers have been found. There have been spasmodic flows of petroleum and salt water at Sour Lake from a well drilled there recently, which the inflowing sand arrests by completely filling up the inside of the tubing. There were two oil horizons found—one at 850, and the other at 1065 feet, accompanied with salt water over 100° F. in temperature and enormous quantities of loose sand. Saratoga, about twelve miles west of Sour Lake, has furnished a well that is producing about fifty barrels of heavy petroleum per day. At Jennings, La., ninety miles east of Beaumont, a similar condition as that reported at Sour Lake is found. At a depth of 1840 feet a flow of petroleum and loose sand was encountered, but the oil was soon cut off by the sand, completely filling up the casing.

The development of this high grade of liquid fuel in a section of the South that is destitute of coal deposits and so near tidewater has added materially to its value. It has been introduced on the principal railroads of Texas, in sugar refineries, electric-light plants and other industries requiring fuel. It has been loaded into tank-ships and transported to England and to several Atlantic seaboard refineries, but as yet the possibilities of the supply are enormously in excess of the present and prospective demand. The number of companies owning wells of large capacity without facilities for delivery has made the competition for the sale of the oil severe. Some of them are reported to have sold a portion of their production as low as two and three cents per barrel, although the average price probably has been close to twenty cents per barrel. The low price has attracted investors, and at the close of the year about 500,000 barrels have been purchased and stored in tanks for future demand. There is at present over 1,000,000 barrels in tanks in the section. There has been an increasing shipment by rail. The average for December was about 15,000 barrels per day, or 450,000 barrels per month. Many of the wells alone would originally have more than supplied this amount.

The actual production of the entire field was not in excess of 3,500,000 barrels. This estimate was partly made up of the petroleum estimated to have been produced by the original gusher, which amounted to nearly 1,000,000 barrels. This was collected in a lake not far from the well, where it was held for several months, finally taking fire, when it was consumed. The following is an approximate division of the total production in 1901: Production of the original well, and consumed by fire, 850,000 barrels; shipments by rail, 1,500,000 barrels; shipments by water, 250,000 barrels; held in tanks, 900,000 barrels—total, 3,500,000 barrels. Time and large outlays of capital are necessary to market a sudden large production, especially in a section where the requirements for fuel, outside of transportation, are slight. The greater part of it will necessarily be transported by water.

The Corsicana field, 200 miles northwest of Beaumont, has been producing since 1897. Up to the close of 1901 this field has produced close to 3,000,000 barrels of petroleum. The past year the production was close to 800,000 barrels of superior quality, yielding about 11 per cent. of naphtha, 55 per cent. of illuminating products, leaving 33 per cent. for residuum and loss. There are great possibilities scattered over the immense area of this State, although the past year has contributed a vast number of dry holes along the coastal plain from Beaumont to the Mexican border—few, however, when compared to this great area.

What the future will develop when better facilities for marketing the petroleum at Spindle Top are secured is still a matter of conjecture. The impression is strong that the wells must soon loose their gusher qualities, and then the methods of pumping or baling must be resorted to, and there must be a great falling off in the production and increase in operating expenses. From the area thus far developed, it would seem impossible for the strata underlying Spindle Top to yield more than 15,000,000 barrels. The latter dregs will have to be secured in a tedious and costly manner. Deeper drilling may develop other pay streaks. The prospects, however, are favorable for many of the stock companies losing their entire capital which they have so rashly invested in this locality.

Kentucky.

During the past year this State has produced and marketed more petroleum than ever before, although the first well that produced large quantities of petroleum was developed in prospecting for salt water in Cumberland county near Burksville in 1829. It was known as the American well, and flowed many thousands of barrels of oil into the Cumberland river, causing a conflagration that was remembered by the early residents for many years thereafter. This well continued to flow in a small way up to 1860. Many new wells were drilled in this locality after the discovery by Captain Drake in Pennsylvania in the year 1859. These wells yielded large quantities of petroleum for a short time, and then ceased to produce. In more recent years a number of wells have been drilled in this old region without finding petroleum in paying quantities. Perhaps the oldest well drilled for salt water which produced petroleum in this State was in Wayne county, on the south fork of the Cumberland, not far from the Tennessee line. This well was drilled in 1818, producing a dark lubricating petroleum for many years.

Indications of petroleum and natural gas are found in many counties scattered over the State, beginning in the northeastern portion, extending over a broad area south and southwest to the southern-central portion. Gas is found in Henderson, Meade and Hardin counties. The geological horizons extend from the upper subcarboniferous sandstones and limestones to those of the lower Silurian. The conglomerates above the subcarboniferous limestone, including the Berea sand, have furnished some petroleum and gas in Eastern Kentucky. The southern-central portion produces petroleum from the measures above the Trenton limestone. There is a great thinning of nearly all the measures in this region, excepting the subcarboniferous limestone group, which is greatly enlarged. In fact, all the measures from this formation to the Devonian black slate are almost altogether composed of limestone.

The present petroleum production is confined to the counties of Wayne, Floyd, Knox, Barren and Bath. During the latter half of 1901 the production of Wayne county was greatly increased by the drilling in of a number of vigorous wells in what is known as the Sunnybrook field. The first productive well in this locality was drilled March 30 by the Somerset Oil Co., which produced thirty barrels per day for some time. On May 27 another well in this same locality was drilled in by the same company, which produced over 300 barrels per day for several months. The production came from a depth of 878 feet in what is considered to be the representative of the Hudson river group, although the first well got the pay 100 feet higher.

The production in this field does not seem to come from any well-defined horizon in the strata, but varies from a depth of 885 feet up to 750 feet from the surface in what is considered to be the representative of the Hudson river group, and so far seems to be confined to that portion of the strata that has been slightly elevated and depressed, forming low anticlinals and synclinals.

The entire production of this producing region, including that of Slickford and Beaver creek, which were comparatively insignificant, was 113,500 barrels for the year, most of which was pumped forty miles to Somerset by pipe line, and there shipped by railroad. A considerable quantity was marketed through the South as an enricher of manufactured gas.

Throughout this pool, embracing a part of Scott and Pickett counties, Tennessee, and Wayne county, Kentucky, thirty-eight wells were drilled, only twelve of which were profitable producers. There are at present twenty-one drilling wells and nineteen rigs in this field.

The other most important production is in the western portion of Floyd county, where the output of some ten wells has been accumulating in tanks. These tanks have lately been connected with the Chesapeake & Ohio Railroad at Whitehouse by a pipe line thirty miles in length. During the past year there were shipped 13,000 barrels. Several new wells were opened up in this section during the past year, extending over into Knott county, all of which found their oil in the strata above the "big lime," which corresponds with the lower coal measures, or what is known as the salt-sand group by the driller. The production for the year is estimated at 1000 barrels.

Knox county has been brought into prominence by the drilling in of a well six miles northeast of Barboursville that started to flow at the rate of 250 barrels per day, but it unfortunately caught fire, and the derrick and surroundings were destroyed. There have been twenty-six wells drilled in this region during the past year, a number of which yielded a rather dark, heavy oil, in the sandstone layers of the lower coal measures.

The Barren county field has continued to produce some petroleum. There have been a number of wells drilled in Bath county which have produced a very dark, heavy oil. Over this entire region, extending over into Tennessee, during the past year there have been upwards of eighty wells drilled, and of this number not more than twenty have been paying wells.

The entire production of the State has been placed at 128,000 barrels, of which 113,500 barrels were produced in the Wayne county fields.

The entire production of the State before and including 1883 to the close of 1901 has been as follows. (A small part of the production in Floyd county which has not been marketed is included in this statement.) The production during 1901 has been about 44 per cent. of the total previous production:

PRODUCTION OF PETROLEUM IN KENTUCKY FROM 1883 TO AND INCLUDING 1901.
(Barrels of 42 gallons.)

Year.	Production.	Year.	Production.	Year.	Production.
Prior to 1883	160,933	1890	6,000	1898	5,568
1883	4,755	1891	9,000	1899	24,580
1884	4,148	1892	6,500	1900	39,384
1885	5,164	1893	3,000	1901	128,000
1886	4,726	1894	1,500		
1887	4,791	1895	1,500	Total	421,759
1888	5,096	1896	1,680		
1889	5,400	1897	322		

Tennessee.

The production of this State has been confined almost entirely to that most remarkable well in Fentress county near the Pickett county line, in northern-central Tennessee, on the Obey river, known as the "Bobs Bar" well, which was drilled in 1896, and found a reservoir of petroleum at a depth of 276 feet. This was 155 feet below the bottom of the Devonian black slate, here thirty feet thick. At the close of 1901 this well was still producing twenty barrels per day. Numerous small wells in a range of two to eight miles from it as a center have been drilled into and past this horizon. Some of these have produced a moderate amount of petroleum, but nothing to compare with the initial well. During the past year new wells have been drilled in Pickett and Fentress counties not far from the Sunnybrook field that have had fair indications of petroleum, but none yet have proven to be paying producers. Putnam county at one time produced some petroleum, but is now abandoned. Renewed activity has developed in drilling in Dixon county, thirty-five miles west of Nashville.

During the year 1901 this "Bobs Bar" well produced 5600 barrels, making the total output 22,000 barrels, which, outside of several thousand barrels produced on Spring creek, in Putnam county, twenty years previous, represents the total production of Tennessee. It is to be hoped that some one of the many wells being drilled in various sections of the State will find some new production.

E. H. Oliphant

Progress in the Southern Phosphate Belt

By HUGH WILEY

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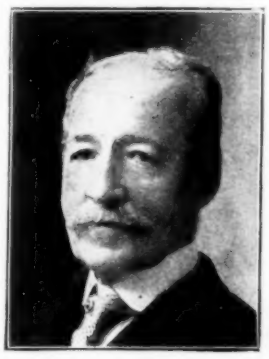
Of the various influences contributing to the progress of the South in the past twenty years one may view with intense satisfaction the realization of the wealth of its phosphate belt. The Southern phosphate belt proper, a decade ago, was said by several authorities to hug the coast of the Atlantic ocean and the Gulf of Mexico from New Jersey to Texas, embracing in that portion of the tertiary strata of workable phosphate deposits the most extensive marl beds in the world. Since 1890 the rich Tennessee field has been uncovered, showing immense wealth in phosphates of high analysis. Deposits of more or less commerical value have been located in Virginia, North Carolina, Georgia and Arkansas, while the Florida field has produced and gives evidence of a future production of millions of dollars' worth of phosphate rock. The importance of the discovery of phosphate rock in South Carolina has been a theme for the geologist, and has proved a paying investment to capitalists who have entered that field. While it is stated that marl deposits were known to exist in that State as far back as 1802, it was not until 1837 that a number of rolled or water-worn nodules of a rocky material were found with the impressions of marine shells. These rocks were scattered over the surface of the land, and were gathered in heaps so as not to interfere with the cultivation of the soil. Mining engineers in 1843, while boring, discovered beds containing the remains of extinct animals and relics of human workmanship. In 1861, specimens of phosphate rock in South Carolina were analyzed, and practical work commenced in the development of the industry.



HUGH WILEY.

A check to operations was given by the Civil War, and it was not until 1867 that attention was again directed towards the pursuit of the industry. The South Carolina Mining & Manufacturing Co. was organized, and in 1868 the first cargo of rock was shipped to Baltimore by John R. Dukes, president of the Wando Phosphate Co. of Charleston. The famous Coosaw Company entered the field in 1870, and under the organization composed of Baltimore and Charleston capitalists has been, perhaps, the most successful of all the companies operating there. From 1867 to 1869 South Carolina controlled the business in phosphate rock and regulated prices, the land-mining companies supplying all domestic demands, and the river companies meeting the wants of foreign ports, in the meantime having but little opposition from any quarter. Other countries, however, became producers of greater or less quantities of phosphate. Guano came from the Chincha Islands, Peru, and the islands of the Caribbean sea; kainit from Germany, nitrate of soda from South America. In 1889 Florida entered the field with its vast beds of rock to be developed, and in a few months it had its effect upon the Carolina product. The industry in 1891, consequently, showed there a decline in production, the amount going out being placed at 548,390 tons, against 572,949 tons in 1890. The competition of Florida phosphates became a disturbing factor in the market for Carolina rock, and from a variety of other causes affairs became unsettled. The entrance of the Coosaw Company into the phosphate field, after a settlement with the State, gave the market a better tone in 1892, and in the commercial year of 1892-93 the shipments aggregated 618,569 tons.

From 1893-94 miners were cautious in their operations, and although stocks above ground accumulated, the output was regulated in proportion to the demand. Many companies withdrew from the field, and a year or two ago operations practically ceased until a reduction in stocks warranted the companies resuming. At the moment the indications are favorable for a substantial business in mining, though the phosphate rock mined in the State last year amounted to 82,656 tons, against 119,208 in 1900. As to the future capacity of production, it may be interesting to note that ten years ago several authorities estimated the explored but then unexploited area of land and river deposits at no less than thirty miles, capable of producing 14,000,000 tons of phosphate rock. South Carolina rock will always be in demand, as it is regarded as a material of high grade in the manufacture of soluble and available phosphates.

The following table shows the rock mined in that State from the beginning of operations in 1868 to 1890, inclusive, and the shipments of rock from the commercial year of 1890-91 to 1900-1901, inclusive:

LAND AND RIVER ROCK MINED IN SOUTH CAROLINA FROM JANUARY 1, 1880, TO DECEMBER 31, 1889.

Year.	Land rock. Tons.	River rock. Tons.	Total. Tons.
1880	125,000	65,162	190,162
1881	141,000	124,541	265,541
1882	190,000	140,772	330,772
1883	226,000	129,318	355,318
1884	258,000	151,243	409,243
1885	224,000	171,671	395,671
1886	294,000	191,194	485,194
1887	230,000	202,757	432,757
1888	260,000	190,274	450,274
1889	250,000	212,101	462,101
Total tons	2,198,000	1,579,033	3,777,033

SHIPMENTS OF PHOSPHATE ROCK FROM SOUTH CAROLINA PORTS FROM SEPTEMBER 1, 1890, TO AUGUST 31, 1900.

	Charleston. Tons.	Beaufort. Tons.	Total. Tons.
1890-91	392,743	180,206	572,949
1891-9	371,736	176,660	548,396
1892-93	318,456	302,113	618,569
1893-94	339,791	136,408	476,199
1894-95	276,778	154,597	431,375
1895-96	330,827	114,220	445,047
1896-97	322,272	111,846	434,118
1897-98	323,121	86,460	409,581
1898-99	355,165	125,911	481,076
1899-1900	292,809	135,753	428,562
Total	3,321,698	1,524,174	4,845,872

The career of Florida as a producer of phosphates dates from 1888, when the Arcadia Phosphate Co. commenced operations in Peace river with considerable success, considering the conditions under which it worked. The operations of this company were noted by skeptics and capitalists, who stood ready to take up the work when results warranted an investmnt. The Peace River Phosphate Co. and the De Soto Phosphate Co. followed in 1889, and commenced dredging the river with an expensive and up-to-date plant. Soon, however, the success of these companies became known, and a boom followed. The State became wild with excitement and speculation. Lands valued at $1.50 to $3 per acre advanced to $150 and $200 per acre, and a number of poor settlers suddenly became wealthy. In 1891 the excitement had become so great that nearly 100 companies had been organized, with a combined capitalization of over $58,000,000. Most of them, however, were purely of a speculative character, and their peculiar methods had a tendency to injure the operations of men of means who entered the phosphate field to mine for profit. The companies in the field in 1892 labored under many disadvantages, and with the crude methods of mining and facilities for shipping, a number retired from the field.

In 1893 the speculative spirit still continued to some extent, but those companies organized for mining and for actual development found themselves in a peculiar position, namely, that of solving the problem of how to meet low prices and deal with the question of railroad rates. Florida phosphate rock at this date had established a character at home and abroad. Experimenting had ceased, and the product was recorded as a staple commodity. Hard rock was going out to Spain, Italy, Sweden and Denmark, and soft rock to the Sandwich Islands. The State was getting in good shape for trade, and the industry in 1893 took on new life under improvements in shipping facilities of the ports.

The Florida Central & Peninsular Railroad had expended large sums of money for better accommodations for shipping at Fernandina in erecting elevators and warehouses for storing 12,000 to 15,000 tons of rock in order that vessels might be loaded with dispatch. Port Tampa had good accommodations for loading vessels, with good wharves and storehouses, while Punta

Gorda was the southern limit for pebble shipments. The Plant System and other roads early showed their confidence in the phosphate industry by improving terminals and building spurs to connect with the mines throughout the State. The progress of development was rapid, new and expensive plants for mining and washing were erected, and the output of both land and river pebble began to show an increase. Down to the present there has been an active development in both hard rock and pebble, but the output, with low prices, has often been of such magnitude as to seriously affect the industry. The miners of Algeria and other ports on the Mediterranean have watched the progress of Florida miners, and have made strenuous efforts to compete with them, but up to the present they have not scored much success. The position of Florida rock abroad is a prominent one, and the quality of the rock has always ranked in the market at the head of the list. It is a pleasing fact to notice that Florida miners, while having no distinct organization, are in touch with each other, and in the pebble region especially are gauging the output to meet the current domestic and foreign demand.

The following tables represent the shipments from the ports since the inception of the industry, and also for the fiscal year 1900-1901:

SHIPMENTS OF FLORIDA PHOSPHATE ROCK SINCE THE INCEPTION OF THE INDUSTRY.

Port.	1888-91.[1]	1892.[2]	1893.[2]	1894. 8 mos.[2]	1894-95.[2]	1895-96.[2]	1896-97.[2]	1897-98.[3]	1898-99.[3]	1899-1900.[3]	1900-01.[3]	Total.
Fernandina	62,100	123,049	126,439	116,380	121,469	161,570	161,048	189,553	245,607	197,760	160,671	1,656,646
Tampa	32,300	70,295	112,358	105,777	157,022	146,646	167,783	133,830	173,170	207,569	311,801	1,618,551
Punta Gorda	78,900	63,234	89,313	75,627	84,160	63,864	113,899	43,209	85,571	69,219	49,067	816,063
Savannah	8,100	7,412	28,875	23,242	67,877	67,581	99,287	70,182	68,220	126,860	144,861	712,497
Brunswick	2,280	15,469	34,186	44,074	41,978	31,092	35,631	58,807	71,494	7,815	23,009	365,935
Jacksonville	4,980	.....	.....	.....	.....	.....	.....	406	.....	.....	.....	5,386
Pensacola	.....	.....	.....	.....	.....	.....	.....	34,601	.....	.....	.....	34,601
Key West	.....	.....	.....	.....	.....	.....	45,000	30,000	52,107	.....	11,680	138,787
Railroads	41,960	20,000	22,800	15,000	30,000	30,000	40,000	45,000	50,000	55,200	60,000	409,960
Consumed	6,200	15,000	18,000	12,500	13,000	16,000	25,000	26,000	30,000	45,000	40,000	246,700
Total	236,920	314,459	431,971	392,600	515,506	516,753	687,648	622,588	776,169	709,423	801,089	6,005,126

[1]Irregular shipments. [2]Fiscal year. [3]Commercial year.

SHIPMENTS OF HIGH GRADE AND PEBBLE ROCK FROM THE PORTS FOR THE FISCAL YEARS OF 1900 AND 1901.

Month.	Fernandina. Foreign. Tons.	Tampa. Foreign. Tons.	Tampa. Domestic. Tons.	Punta Gorda. Foreign. Tons.	Punta Gorda. Domestic. Tons.	Savannah. Foreign. Tons.	Brunswick. Foreign. Tons.	Total. Tons.
January	7,100	12,798	19,712	....	3,689	9,386	677	53,362
February	13,704	7,100	12,985	....	2,805	17,106	1,600	55,300
March	22,280	14,000	18,448	....	.....	12,059	3,002	69,799
April	8,325	21,100	13,815	....	2,370	16,428	1,991	64,029
May	13,755	11,030	12,040	2,795	4,860	16,042	3,552	64,074
June, 1901	7,930	13,787	9,927	6,035	1,660	6,553	4,356	50,248
July	13,380	26,276	12,987	7,295	1,720	7,640	510	69,808
August	43,910	10,700	6,290	2,665	....	10,287	....	73,852
September	28,080	3,800	6,800	....	....	18,483	5,243	62,406
October	18,135	9,093	7,350	....	....	20,872	2,248	57,698
November	4,200	11,973	29,575	....	....	17,498	4,335	67,581
December	2,600	893	20,688	....	10,928	11,031	31,880	78,020
Total	183,409	142,550	170,617	18,790	28,032	163,385	59,394	766,177
Year 1900	173,826	126,757	114,006	21,427	33,079	122,880	9,040	601,015

The discovery of phosphate rock in Tennessee was one of great importance, and came as a surprise to the commercial and scientific world. In 1887, visitors to Maury county, in that State, were often disposed to make researches in the vicinity of Columbia, examining war relics and the ruins of old fortifications. On one of these prospecting tours by Dr. R. A. Gattinger, formerly assistant State geologist of Tennessee, traces of phosphate rock were discovered, but pronounced by experts to be too insignificant as to quantity to be of any practical value. Prospecting, however, with more or less success, continued, and in the fall of 1892 William Shirley of Columbia found a vein of kidney-shaped rock near that town showing when analyzed 65 to 70 per cent. bone phosphate of lime, and readily merchantable. In October, 1893, an 18-inch vein and a considerable quantity of nodular rock was discovered on Knob creek six miles northeast of Columbia. An analysis of the deposit was made and two tons of the rock broken up and shipped to Nashville. Prospecting continued vigorously during the month of December, 1893, and on Swan creek, in Lewis county, twenty miles west of Columbia, a very dark rock in a regular vein similar to coal was discovered, which proved from analysis to be first-class phosphate rock. A tract of 2000 acres of this territory was at once secured, and the Tennessee Phosphate Co. was organized by Maj. W. J. Whitthorne and associates. In 1894 phosphate rock was discovered in Perry county along the Buffalo and Tennessee rivers. The Mount Pleasant phosphate was discovered in 1896, when the rush of speculation and activity began, while in Hickman, Franklin, Sumner and other counties rich deposits have been found. The geologist of the State of Tennessee has estimated that in 1900 there were 2800 square miles of territory in the State covering phosphate beds and extending over twenty-seven counties. The four largest phosphate beds are the Mount Pleasant, Swan creek, Duck river and Tennesee river fields. There are also other fields of considerable extent and richness, and recent examination of the Mount Pleasant, Sumner and other sections goes to show that the quantity of rock in sight has by no means been exaggerated. Statistics, however, are incomplete, but in the absence of organized bodies or a bureau at Mount Pleasant and other points, geological surveys, railroads and individual researches furnish important data in regard to output and shipments.

Eminent geologists and chemists, such as Dr. J. M. Safford, Prof. J. C. Wharton and Dr. R. A. Gattinger, have exhibited untiring energy in their researches in the various phosphate fields, and have placed information about the numerous geological features of the industry and chemical properties of the products in form for the guidance of miners and investors. The State is now among the leading phosphate producers of the world, the production having attained great proportions, while the character of the product has been established in all domestic and foreign markets.

The following table shows the estimated production of phosphate rock in Tennessee since the inception of the industry:

Year.	Long tons.	Value.
1894	19,188	$67,158
1895	38,515	82,160
1896	26,157	57,370
1897	128,723	193,115
1898	308,107	498,392
1899	424,109	1,177,166
1900	450,856	1,125,000
1901	420,000	1,255,000
Total	1,815,655	$4,455,361

Hugh Shirley

IMMIGRATION TO THE SOUTH NEEDED

By P. J. GOODHART
of P. J. Goodhart & Co., New York

The remarkable development of the South during the past decade has almost exclusively been the result of the work of its own people. Capital has come largely from the North, from those having Southern affiliations, but the work itself has been local. In most instances where manufacturing enterprises in the South have failed, examination has shown that it has not been due to any defect in the physical surroundings, or in the character of the undertaking, but has invariably been due to unsound financial methods, generally a lack of working capital. Few concerns, if any, would have failed had but half the capital been invested in the plant, and the other half retained as a working capital, and the concern developed from a smaller beginning.

P. J. GOODHART.

No section of the country will feel the benefits of the Spanish-American War more than the South. The South's material interests will be immeasurably benefited by the increasing sales of cotton goods, coal and iron to our new possessions and to Cuba.

What the South needs above all things is a concerted effort to secure part of the 500,000 immigrants who come annually from Europe, and who supply the labor markets of the North, West and the great Northwest, not to speak of those who enter the great field of agriculture.

The West and Northwest have practically been settled through the efforts of the railroads. Owing to their great land grants, they have maintained immigration bureaus not only in the leading cities of the East, but also in European centers, directing immigration along the lines of their respective roads. Colony upon colony has been located in Wisconsin, Minnesota, North and South Dakota and Kansas. Many have had their tribulations as well as their successes. Only a few years' residence in this country, however, has been necessary to thoroughly Americanize our immigrants.

The four great railroad systems of the South have been practically rebuilt in the last ten years, and they are now equal to any in the country in physical condition. Through the development of the South rests their increasing earning capacity. They are close to the people in sentiment and operation, and therefore, instead of any restrictive legislation, should receive every encouragement from those whose progress is their progress. What the railroads of the West have done, not only in encouraging, but actually accomplishing, in bringing immigration to their sections, the railroads in the South should unitedly do for that section. Headquarters should be secured in the city of New York, where upwards of 350,000 immigrants land annually, and a leader of experience should be placed in charge of the undertaking. Associated with him should be a German, an Englishman, a Swiss, an Italian and a representative of every foreign nation, conversant with the South, its desirability and possibilities as a home and source of livelihood for these newcomers. The Italians would be among the best of our daily laborers, and the Germans and the Swiss would be interested in new fields of agriculture. The mountain districts would especially be attractive to these latter people.

Initial results are always difficult of accomplishment, but once have the tide of immigration tend toward the South, and I am sure the results will be such that it will be but a beginning of a great movement.

P. J. Goodhart

The Industrial Development of the South

By HON. WILLIAM R. MERRIAM

Director of the United States Census

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Time changes all things; the old giveth place to the new." I have seen this somewhere—where, I do not recollect. It is a fitting sentiment to express at the outset in the preparation of an article with reference to the industrial development of the South during the last three decades. From the dawn of time there have been men who have been willing to foretell the future possibilities of every civilization and of every government—wiseacres who have been, in their own judgment, capable of outlining policies for coming centuries and painting pictures of a glowing future for all lands and for all governments. But wise as our forefathers were—I refer to those who laid the foundations of our government so well—they did not foresee the situation at the end of the nineteenth century, at least so far as the South is concerned. Most of them were willing to stake their reputations—so, at least, their written speeches indicate—that the South would be at least for many decades a great agricultural country, and have little else to commend it to the consideration of those who build for the future. As sagacious as Thomas Jefferson was, he had no conception that the beginning of the twentieth century would find the United States of America one of the greatest industrial nations on the globe. His environments were pastoral, and he little dreamt of the commercial possibilities of the future. Many of the great leaders of the country in its earlier history were from the South. They labored to upbuild the principle of free trade on the ground that the chief product of the South sold to the foreigner being cotton, the imports received in exchange for this commodity should come in without limitations or restrictions. It is a question whether Calhoun, a man of great ability and remarkable achievements, had the slightest idea of the great bounds toward industrial prosperity that would inure to the South near the end of the century in which he played so prominent a part.

WILLIAM R. MERRIAM.

The fourteen Southern States can no longer be classed as agricultural only. These great Commonwealths have commenced to take their part in the marvelous growth of mechanical and commercial enterprise which is characteristic of our Northern States. The data that has recently been given out at the census office, collected under the supervision of Mr. S. N. D. North, chief statistician for manufactures, will excite the liveliest interest among all the people of our country and give considerable encouragement to our friends from the South. Of necessity, statistics are uninteresting and commonplace, and we shall be compelled to give many figures which, were it not for the national growth they portray, would be dry and unreadable except for those actively interested in statistics. The figures given will emphasize the remarkable advance in the number of establishments and output in some of our Southern Commonwealths.

A tabulated statement is given below showing the figures for the manufactures of the Southern States for 1900, 1890 and 1880. The statement includes the number of establishments, capital invested and average number of wage-earners during the census year, and total wages paid:

MANUFACTURES OF THE SOUTH, COMPARED FOR 1900, 1890, 1880.

State.	Number of establishments.	Capital.	Wage-earners, average No.	Total wages.	Miscellaneous expenses.	Cost of material used.	Value of product, including custom work and repairing.
1900.							
Maryland	9,880	$163,422,260	108,361	$38,761,551	$17,226,623	$144,539,680	$242,752,990
Virginia	8,245	103,512,855	72,528	22,396,060	12,258,244	74,762,749	132,735,620
West Virginia	4,415	55,719,938	33,085	12,876,902	3,933,514	42,632,813	74,177,681
North Carolina	7,226	76,503,894	70,570	13,868,430	9,118,637	53,072,388	94,919,063
South Carolina	3,762	67,356,465	48,135	9,455,900	3,111,587	34,027,795	58,748,731
Georgia	7,504	89,789,656	83,842	20,280,071	5,321,330	58,232,202	106,654,527
Florida	2,115	34,473,997	37,094	11,359,367	2,411,539	15,786,526	38,189,894
Kentucky	9,560	104,070,791	62,962	22,434,185	19,581,630	82,773,415	154,605,115
Tennessee	8,069	71,222,680	50,274	16,552,534	6,175,499	63,415,386	107,527,060
Alabama	5,602	70,370,081	52,902	15,130,419	3,828,402	46,151,026	82,793,804
Mississippi	4,772	35,807,419	26,418	7,471,886	1,476,855	21,692,092	40,431,386
Louisiana	4,350	113,084,294	42,210	15,385,715	7,999,870	82,299,893	121,181,683
Arkansas	4,794	35,960,640	26,501	8,686,291	1,482,779	23,963,768	44,883,783
Texas	12,289	90,433,882	48,152	20,552,355	6,144,924	67,102,769	119,414,982
Total	92,522	$1,111,688,852	763,277	$235,212,339	$100,066,277	$810,434,542	$1,419,001,873
1890.							
Maryland	7,485	$119,667,316	97,808	$34,441,414	$10,616,347	$92,059,390	$171,842,593
Virginia	5,915	63,456,799	53,566	15,816,930	7,421,087	50,148,285	88,363,824
West Virginia	2,376	28,118,030	19,340	6,911,779	1,960,929	23,729,089	38,702,125
North Carolina	3,667	32,745,995	33,625	6,552,121	3,329,101	22,789,187	40,375,450
South Carolina	2,382	29,276,261	22,748	5,474,739	1,792,386	18,873,666	31,926,681
Georgia	4,285	56,921,580	52,298	14,623,996	4,019,539	35,774,480	68,917,020
Florida	805	11,110,304	13,119	5,918,614	1,131,067	8,021,854	18,222,890
Kentucky	7,745	79,811,980	56,558	21,326,831	15,879,728	63,677,583	126,719,857
Tennessee	4,559	51,475,092	37,487	13,557,180	4,126,271	40,463,782	72,355,286
Alabama	2,977	46,122,571	31,137	10,799,747	2,797,896	28,432,281	51,226,605
Mississippi	1,698	14,896,884	14,465	4,191,754	827,627	10,064,897	18,705,834
Louisiana	2,613	34,754,121	28,377	10,122,569	3,760,753	33,282,724	57,806,713
Arkansas	2,073	14,971,614	14,143	4,649,186	1,035,107	12,397,261	22,659,179
Texas	5,268	46,815,181	34,794	15,148,495	3,594,940	36,152,308	70,433,551
Total	53,848	$630,143,728	509,465	$169,535,355	$62,292,778	$475,866,787	$878,257,608
1880.							
Maryland	6,787	$58,742,384	74,945	$18,904,965		$66,937,846	$106,780,563
Virginia	5,710	26,968,990	40,184	7,425,261		32,883,933	51,780,992
West Virginia	2,375	13,883,390	14,311	4,313,965		14,027,388	22,867,126
North Carolina	3,802	13,045,639	18,109	2,740,768		13,090,937	20,095,037
South Carolina	2,078	11,205,894	15,828	2,836,289		9,885,538	16,738,008
Georgia	3,593	20,672,410	24,875	5,266,152		24,143,939	36,440,948
Florida	426	3,210,680	5,504	1,270,875		3,040,119	5,546,448
Kentucky	5,328	45,813,039	37,391	11,657,844	Not reported	47,461,890	75,483,377
Tennessee	4,326	20,092,845	22,445	5,254,775	for 1880.	23,834,262	37,074,886
Alabama	2,070	9,668,008	10,019	2,500,504		8,545,529	13,565,504
Mississippi	1,479	4,727,600	5,827	1,192,645		4,667,183	7,518,302
Louisiana	1,553	11,462,468	12,167	4,360,371		14,442,506	24,205,183
Arkansas	1,202	2,953,130	4,557	925,358		4,392,080	6,756,159
Texas	2,996	9,245,561	12,159	3,343,087		12,956,269	20,719,928
Total	43,725	$251,692,038	298,321	$71,992,859		$280,309,410	$445,572,461

SUMMARY OF THE MANUFACTURES OF THE SOUTHERN STATES.

	1900.	1890.	1880.	Increase, 1890 to 1900.	Increase, 1880 to 1890.	Percentage of Increase, 1890 to 1900.	Percentage of Increase, 1880 to 1890.
No. establishments	92,522	53,848	43,725	38,674	10,123	71.8	23.2
Capital	$1,111,688,852	$630,143,728	$251,692,038	$481,545,124	$378,451,690	76.4	150.4
Wage-earners, average No.	763,277	509,465	298,321	253,812	211,144	49.8	70.8
Total wages	$235,212,339	$169,535,355	$71,992,859	$65,676,984	$97,542,496	38.7	135.5
Miscel'us expenses	100,066,277	62,292,778	(1)	37,773,499	(1)	60.6	(1)
Cost of materials used	810,434,542	475,866,787	280,309,410	334,567,755	195,557,377	70.3	69.8
Value of products	1,419,001,873	878,257,608	445,572,461	540,744,265	432,685,147	61.6	97.1

(1) Not reported for 1880.

Maryland.

The first State considered is Maryland. A summary is here given for all establishments in the State. This summary includes those engaged in the hand trades, and also those having a product of less than $500. The note to the summary will be of some interest to those working in the hand trades, as it gives the number of small establishments in the various lines of industry:

SUMMARY FOR ALL ESTABLISHMENTS.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	4,550	$9,639,941	4,920	11,518	$5,221,050	$2,274,333	$9,951,381	$101,225	$9,710,938	$139,218	$23,054,608
Governmental establishment	1	169,100	.....	13	4,689	.....	8,463	.....	7,763	700	13,652
Eleemosynary and penal institutions	6	280,973	.....	270	43,402	17,142	111,131	30,152	75,273	5,706	215,293
Establishments with a product of less than $500	1,642	550,593	1,910	243	11,834	62,431	150,637	13,963	136,498	176	521,121
All other establishments	5,330	153,782,319	6,205	96,843	33,540,501	14,952,290	134,588,299	36,328,877	93,909,104	4,350,318	219,698,382
Total	11,529	$164,422,926	13,035	108,887	$38,821,476	$17,306,196	$144,809,911	$36,474,217	$103,839,576	$4,496,118	$243,503,056

[1] Includes bicycle and tricycle repairing, 71; blacksmithing and wheelwrighting, 877; boots and shoes, custom work and repairing, 719; carpentering, 393; clothing, men's, custom work and repairing, 408; clothing, women's, dressmaking, 583; dyeing and cleaning, 58; furniture, cabinetmaking, repairing and upholstering, 136; lock and gun smithing, 59; masonry, brick and stone, 106; millinery, custom work, 235; painting, house, sign, etc., 308; paperhanging, 107; plastering and stuccowork, 46; plumbing, and gas and steam fitting, 245; sewing-machine repairing, 11; watch, clock and jewelry repairing, 188.

In addition to the 11,529 active establishments reported in operation during the census year 1900, with a capital of $164,422,926, as shown in the statement for all establishments, there were thirty-seven idle establishments, with a capital of $1,226,058, divided among the different industries as follows:

Industries.	No. of idle establishments.	Capital.
Ammunition	1	$142,628
Dyestuffs and extracts	1	10,965
Flouring and grist mill products	3	12,405
Iron and steel	3	247,934
Leather, tanned, curried and finished	1	8,750
Liquors, distilled	3	110,000
Liquors, malt	2	410,000

Industries.	No. of idle establishments.	Capital.
Lumber and timber products	10	$8,975
Paper and wood pulp	2	38,000
Pottery, terra-cotta and fire-clay products	2	135,000
Sugar and molasses, refining	1	75,000
Woolen goods	1	10,000
All other industries	7	16,401

During the year 1900 there were in operation 9880 establishments, with a capital of $163,422,260, being an increase of 36.6 per cent. over the year 1890. A comparative summary in detail is given on the following page.

COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT. OF INCREASE FOR EACH DECADE.

	Date of Census.						Per Cent. of Increase.				
	1900.	1890.	1880.	1870.	1860.	1850.	1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
Number of establishments	9,880	7,485	6,787	5,812	3,083	3,725	32.0	10.3	16.8	88.5	[1]17.2
Capital	$163,422,260	$119,667,316	$58,742,384	$36,438,729	$23,220,608	$14,934,450	36.6	103.7	61.2	56.9	55.6
Salaried officials, clerks, etc., number	7,589	[2]9,246	[3]	[3]	[3]	[3]	[1]17.9	....	....	....	....
Salaries	$7,383,263	[2]$7,085,418	[3]	[3]	[3]	[3]	4.2	....	....	....	....
Wage-earners, average number	108,361	97,808	74,945	44,860	28,403	30,212	10.8	30.5	67.1	57.9	[1]6.0
Total wages	$38,761,551	$34,441,414	$18,904,965	$12,682,817	$7,190,672	$7,403,832	12.5	82.2	49.1	76.4	[1]2.9
Men, sixteen years and over	72,860	67,261	46,698	34,061	21,630	22,729	8.3	44.0	37.1	57.5	[1]4.8
Wages	$31,885,361	$29,049,820	[3]	[3]	[3]	[3]	9.8	....	....	....	....
Women, sixteen years and over	29,617	26,432	21,700	8,278	6,773	7,483	12.0	21.8	162.1	22.2	[1]9.5
Wages	$6,112,187	$5,009,548	[3]	[3]	[3]	[3]	22.0	....	....	....	....
Children, under sixteen years	5,884	4,115	6,547	2,521	[3]	[3]	43.0	[1]37.1	159.7	....	....
Wages	$764,003	$382,046	[3]	[3]	[3]	[3]	100.0	....	....	....	....
Miscellaneous expenses	$17,226,623	$10,616,347	[4]	[4]	[4]	[4]	62.3	....	....	....	....
Cost of materials used	$144,539,680	$92,059,390	$66,937,846	$46,897,032	$25,494,007	$17,690,836	57.0	37.5	42.7	84.0	44.1
Value of products, including custom work and repairing	$242,752,990	$171,842,593	$106,780,563	$76,593,613	$41,735,157	$33,043,892	41.3	60.9	39.4	83.5	26.3
Total population	1,188,044	1,042,390	934,943	780,894	687,049	583,034	14.0	11.5	19.7	13.7	17.8
Wage-earners engaged in manufactures	108,361	97,808	74,945	44,860	28,403	30,212	10.8	30.5	67.1	57.9	[1]6.0
Per cent. of total population	9.1	9.4	8.0	5.7	4.1	5.2	....	....	....	....	....
Assessed value of real estate	[5]$616,719,782	$411,900,246	$368,442,913	$286,910,332	$65,341,438	$139,026,610	49.7	11.8	28.4	339.1	[1]53.0
Value of land and buildings invested in manufactures[6]	$45,804,854	$31,268,516	[3]	[3]	[3]	[3]	46.5	....	....	....	....
Per cent. of assessed value	7.4	7.6	.....	.....	.....	.....	....	....	....	....	....

[1]Decrease.
[2]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[3]Not reported separately.
[4]Not reported.
[5]As given in the Maryland Manual for 1900.
[6]Does not include value of rented property.

The reports show a capital of $163,422,260 invested in manufactures and mechanical industries in the 9880 establishments reporting for the State of Maryland. This sum represents the value of land, buildings, machinery, tools and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations of the State. The value of the products is returned at $242,752,990, to produce which involved an outlay of $7,383,263 for salaries of officials, clerks, etc., $38,761,551 for wages, $17,226,623 for miscellaneous expenses, including rent, taxes, etc., and $144,539,680 for material used, mill supplies, freight and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the product is in any sense indicative of the profits in the manufacture of the products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the shop or factory. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

The value of products for the State of Maryland, $242,752,990, is the gross value, and not the net or true value. The difference between these two should be carefully noted. The gross value is found by adding the value of products in the separate establishments. But the finished product of one establishment is often the raw material for another. In such cases the value of the former reappears in the latter, and thus the original cost of certain materials may be included several times in the gross value. The net or true value is found by subtracting from the gross value the value of all materials purchased in a partly manufactured form. In this way the duplications in the gross value are eliminated.

At the census of 1890 the schedule was so framed that it was impossible to find the net or true value. In the present census the schedule asked for the value of the materials in two classes—those purchased in the crude state and those purchased in the partly manufactured form. From the answers to these questions the net or true value of products may be computed. Thus, for Maryland, the gross value of products for 1900 was $242,752,990. The value of materials purchased in a partly manufactured form was $103,620,042. The difference, $139,132,948, is the net or true value of products, and represents the increase in the value of raw materials resulting from the various processes of manufacture.

The report of the manufactures for the census of 1850 is not regarded as perfectly reliable, being somewhat imperfect and fragmentary, owing to inexperience in collecting data of that character. The figures for the State of Maryland for 1850 show a total of 3725 establishments, with a capital of $14,934,450, the value of the products being $33,043,892. With reference to 1880, we find the number of establishments increased to 6787, with a capital of $58,742,384, the value of the output being $106,780,563, showing a great increase in thirty years—1850 to 1880.

It will be noted that the largest number idle during the census year was among the lumber and timber products, with, however, a capital of only $8975. The fourteen leading industries of the State of Maryland and the figures for each are shown in the comparative summary set forth below:

COMPARATIVE SUMMARY OF FOURTEEN LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital	Wage-earners. Average No.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	1,877	$54,699,994	37,241	$12,523,561	$6,382,890	$54,428,483	$86,343,509
	1890	1,470	41,767,867	36,110	9,548,433	3,438,593	35,782,390	57,685,323
Increase, 1890 to 1900	....	407	$12,932,127	1,131	$2,974,128	$3,444,297	$18,646,093	$28,658,186
Per cent. of increase	....	27.7	29.5	3.1	31.1	100.2	52.1	49.7
Per cent. of total of all industries in State	1900	19.0	31.1	34.4	32.3	40.0	37.7	35.6
	1890	19.6	34.9	36.9	27.7	32.4	38.9	33.6
Fertilizers	1900	40	$7,003,376	1,016	$457,692	$354,344	$3,643,846	$5,481,905
	1890	53	6,935,914	1,051	492,682	459,109	3,984,178	6,208,025
Flouring and grist mill products	1900	407	3,428,996	541	229,335	225,357	6,731,805	8,035,343
	1890	335	3,007,730	625	240,083	236,607	5,778,873	6,904,888
Foundry and machine shop products	1900	113	6,381,676	4,696	2,251,777	456,175	3,322,658	8,443,547
	1890	81	4,669,891	3,352	1,665,907	241,148	1,875,508	4,925,672
Fruits and vegetables, canning and preserving	1900	271	4,459,660	7,505	1,379,131	371,108	8,786,518	11,996,245
	1890	197	2,735,008	13,048	1,416,386	151,496	4,416,352	7,196,109
Furniture, factory product	1900	42	1,584,984	1,869	822,540	155,614	1,212,226	2,976,494
	1890	33	1,296,831	1,376	582,129	77,592	1,053,759	2,110,955
Iron and steel	1900	9	2,892,690	2,138	1,029,753	508,298	6,888,916	8,739,405
	1890	10	4,067,574	1,247	371,993	46,077	2,217,173	2,869,208
Lumber and timber products	1900	367	2,622,928	1,964	476,776	63,004	1,390,357	2,650,082
	1890	217	1,459,895	1,552	335,909	54,928	840,941	1,600,472
Lumber, planing-mill products, including sash, doors and blinds	1900	53	3,534,501	1,323	542,262	158,244	2,452,655	3,753,083
	1890	45	1,990,138	1,174	661,361	131,296	2,005,755	3,332,563
Oysters, canning and preserving	1900	16	799,005	1,444	379,591	70,100	1,771,377	2,417,331
	1890	8	953,232	2,834	559,040	43,301	1,877,353	2,834,400
Paper and wood pulp	1900	21	2,720,877	937	326,474	105,571	1,730,910	2,589,540
	1890	17	919,766	472	171,209	157,569	562,604	1,001,945
Shipbuilding:								
Total	1900	47	4,446,023	2,615	1,517,705	141,565	1,798,564	4,161,525
	1890	34	1,315,262	1,043	620,483	92,677	737,457	1,737,674
Ship and boat building, wooden	1900	43	623,435	676	331,873	30,649	391,010	862,034
	[1]1890	...	.....	...	.....	.....	.....	.....
Shipbuilding, iron and steel	1900	4	3,822,588	1,939	1,185,832	110,916	1,497,554	3,299,491
	[1]1890	...	.....	...	.....	.....	.....	.....
Slaughtering:								
Total	1900	82	1,548,488	597	276,413	109,017	7,109,079	8,046,359
	1890	17	693,081	389	182,568	76,159	3,969,563	4,670,620
Slaughtering and meat-packing, wholesale	1900	47	1,318,917	514	242,089	99,239	5,446,717	6,209,857
	1890	14	958,521	368	171,208	75,292	3,668,147	4,311,412
Slaughtering, wholesale, not including meat-packing	1900	35	229,571	83	34,324	9,778	1,662,362	1,836,502
	1890	3	34,560	21	11,360	927	301,416	359,278
Textiles:								
Total	1900	22	9,351,313	6,286	1,526,685	473,178	4,053,682	7,155,722
	1890	32	7,819,324	4,921	1,219,583	378,667	3,890,186	6,218,131
Cotton goods	1900	14	7,709,256	4,727	1,186,014	397,016	3,039,386	5,423,251
	1890	15	7,296,793	4,256	1,055,536	354,478	3,378,016	5,457,792
Hosiery and knit goods	1900	4	311,508	682	119,456	21,981	347,250	514,093
	1890	5	149,656	289	44,566	9,747	87,315	180,823
Woolen goods	1900	4	1,330,549	877	221,215	54,181	667,036	1,218,378
	1890	9	372,875	376	119,481	14,442	424,855	579,516
Tobacco:								
Total	1900	387	3,325,477	4,311	1,306,427	3,691,315	3,535,890	9,896,928
	1890	391	3,600,221	3,026	1,029,120	1,291,967	2,582,688	6,074,591
Chewing, smoking and snuff	1900	5	1,805,611	2,002	564,272	3,233,312	2,496,107	7,054,159
	1890	6	2,203,619	1,178	335,135	928,023	1,534,205	3,216,247
Cigars and cigarettes	1900	382	1,519,866	2,309	742,155	458,003	1,039,783	2,842,769
	1890	385	1,396,602	1,848	693,985	363,944	1,048,483	2,858,344

[1]Not separately reported in 1890.

The fourteen leading industries of the State in 1900, as shown by the foregoing table, embraced 1877 establishments, or approximately 19 per cent. of the total number in the State. The table shows that the canning and preserving of fruits and vegetables is the most important industry in the State. There are 271 establishments reported in 1900, which gave employment to 7505 wage-earners, or 6.9 per cent. of the wage-earners in the State, and their products were valued at $11,996,245, or 4.9 per cent. of the total value of the products of the State. In 1890 there were 197 establishments engaged in the canning and preserving industry, with 13,048 wage-earners and products valued at $7,196,109. There was a decrease of 5543 in the number of wage-earners employed in this industry in 1900, comparing to 1890. The increase in the value of the products, however, during the decade was $4,800,136, or 66.7 per cent. The comparative summary given above gives the figures for the other leading industries in detail, and it is unnecessary to enlarge upon them here.

The figures for the manufactures of the Southern States show that Maryland has led in capital invested for the past twenty years. The figures for 1900 show that Maryland is considerably in the lead.

Virginia.

The State of Virginia is the next State to be considered. The writer noticed some days ago in one of the leading newspapers of the country an editorial comment on the little progress shown in material matters by the State of Virginia. This article appeared but a day or two before the census figures were announced to the public. The manufacturing statistics for the State of Virginia would seem to justify the assertion that that State is not marking time to the tune of progress, but is steadily marching onward from decade to decade. The figures for 1880 show that Virginia operated during that year 5710 establishments, with a capital of $26,968,990 and an average number of wage-earners of 40,184. In 1890 there was an increase of about 200 establishments, but the capital invested had more than doubled, amounting to $63,456,799, the number of wage-earners having increased to 53,566. In 1900 the number of establishments had increased to 8245, an increase of 40 per cent. in the number of establishments; the capital had increased to $103,512,855, comparing to $63,456,799 in 1890, an increase of 63 per cent.; the wage-earners increased 35 per cent., and the value of products 50 per cent. The table given below shows the increase for the State as a whole and for the cities of Norfolk, Petersburg, Richmond and Roanoke:

	1900.	1890.	Per cent. of increase.
Number of establishments	8,245	5,915	39.4
Capital	$103,512,855	$63,456,799	63.1
Wage-earners, average number	72,527	53,566	35.4
Total wages	$22,396,060	$15,816,930	41.6
Miscellaneous expenses	12,258,244	7,421,087	65.2
Cost of materials used	74,762,749	50,148,285	49.1
Value of products, including custom work and repairing	132,735,629	86,363,324	50.2

Norfolk.

	1900.	1890.	Per cent. of increase.
Number of establishments	445	374	19.0
Capital	$6,425,099	$3,417,454	88.0
Wage-earners, average number	4,334	2,391	81.3
Total wages	$1,571,229	$1,016,380	54.6
Miscellaneous expenses	701,597	265,675	164.1
Cost of materials used	5,283,975	2,542,790	107.8
Value of products, including custom work and repairing	9,397,355	5,100,408	84.2

Petersburg.

	1900.	1890.	Per cent. of increase.
Number of establishments	225	271	[1]17.0
Capital	$3,960,987	$3,911,240	1.3
Wage-earners, average number	4,730	5,108	[1]7.4
Total wages	$1,043,550	$1,128,551	[1]7.5
Miscellaneous expenses	658,689	834,420	[1]21.1
Cost of materials used	3,747,656	4,384,462	[1]14.5
Value of products, including custom work and repairing	6,464,464	7,167,004	[1]9.8

[1]Decrease.

Richmond.

	1900.	1890.	Per cent. of increase.
Number of establishments	763	966	[1]21.0
Capital	$20,848,620	$16,785,242	24.2
Wage-earners, average number	16,692	16,891	[1]1.2
Total wages	$5,181,659	$5,753,863	[1]9.9
Miscellaneous expenses	6,158,301	3,290,170	87.2
Cost of materials used	13,161,697	14,014,214	[1]6.1
Value of products, including custom work and repairing	28,900,616	27,792,672	4.0

[1]Decrease.

Roanoke.

	1900.	1890.[1]
Number of establishments	120	
Capital	$2,057,754	
Wage-earners, average number	2,686	
Total wages	$1,178,542	
Miscellaneous expenses	122,145	
Cost of materials used	3,730,926	
Value of products, including custom work and repairing	5,709,817	

[1]Not reported separately in 1890.

The State of Virginia in 1880 was third in value of output, having a total of $51,780,992 in that year. In 1900 Virginia was still third, Maryland and Kentucky having a greater output, but the value of the product of Virginia had increased from $51,000,000 to $132,000,000, an increase which must have been very gratifying to the manufacturers of that State, especially in view of the fact that the State of Virginia has heretofore been regarded as more of an agricultural than manufacturing State.

West Virginia.

The State of West Virginia has shown considerable progress in the past twenty years. West Virginia was organized as a State in 1863, and therefore has appeared in census statistics only since 1870. In 1880 there were 2375 establishments within the borders of the State, with a capital of $13,883,390. In 1890 the number of establishments reported was only one more than in 1880. The capital, however, of the establishments reported had increased in 1890 to $28,000,000, in round numbers, an increase of 102 per cent. over 1880. In 1900 the number of establishments reported was 4415, an increase of 85 per cent.: the capital involved, $55,719,938, an increase of 98 per cent. None of the figures quoted included any of the mining establishments, relating solely to the manufactures. The capital invested in manufactures in the State of West Virginia increased from $11,000,000, in round numbers, in 1870 to $55,000,000 in 1900, which demonstrates that the State is making rapid strides in the direction of manufacturing.

A comparative summary from 1870 to 1890 is given herewith:

Comparative Summary, 1870 to 1900, with Per Cent. of Increase for Each Decade.

	Date of Census. 1900.	1890.	1880.	1870.	Per Cent. of Increase. 1890 to 1900.	1880 to 1890.	1870 to 1880.
Number of establishments	4,415	2,376	2,375	2,444	85.8	[1]	[2]2.8
Capital	$55,719,938	$28,118,030	$13,883,390	$11,084,520	98.2	102.5	25.3
Salaried officials, clerks, etc., number	1,852	[2]2,629	[3]	[3]	[2]29.6	....	....
Salaries	$1,563,097	[2]$1,419,218	[3]	[3]	10.1	....	....
Wage-earners, average number	33 085	19,340	14,311	11,672	71.1	35.1	22.6
Total wages	$12,876,902	$6,911,779	$4,313,965	$4,322,164	86.3	60.2	[2]0.2
Men, sixteen years and over	28,896	17,074	12,300	10,728	69.2	32.4	20.2
Wages	$12,073,006	$6,546,797	[3]	[3]	84.4	....	....
Women, sixteen years and over	3,349	1,455	346	287	130.2	320.5	20.6
Wages	$674,227	$256,183	[3]	[3]	163.2	....	....
Children, under sixteen years	840	811	1,065	657	3.6	[2]23.8	62.1
Wages	$129,669	$108,799	[3]	[3]	19.2	....	....
Miscellaneous expenses	$3,933,514	$1,960,929	[3]	[3]	100.6	....	....
Cost of materials used	$12,632,813	$23,729,089	$14,027,388	$14,503,701	79.7	69.2	[2]3.3
Value of products, including custom work and repairing	$74,177,681	$38,702,125	$22,867,126	$24,102,201	91.7	69.2	[2]5.1
Total population	958,800	762,794	618,457	442,014	25.7	23.3	39.9
Wage-earners engaged in manufactures	33,085	19,340	14,311	11,672	71.1	35.1	22.6
Per cent. of total population	3.5	2.5	2.3	2.6	....	....	....
Assessed value of real estate	[4]$172,250,553	$121,202,365	$105,000,306	$95,924,774	42.1	15.4	9.5
Value of land and buildings invested in manufactures[5]	$15,032,225	$7,754,341	[3]	[3]	93.9	....	....
Per cent of assessed value	8.7	6.4	.....	.....	....	....	....

[1]Less than one-tenth of 1 per cent.
[2]Decrease.
[3]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[4]Not reported separately.
[5]Not reported.
[6]As given for the year 1899 in the Report of the Auditor of the State of West Virginia, page 46.
[7]Does not include value of rented property.

Table 2 divides the industries of the State between the hand trades and the manufactures proper. This table also gives the statistics for educational and eleemosynary institutions, and establishments with a product of less than $500. These were not reported at previous censuses, and therefore are omitted from the other tables and their use confined to Table 2:

Table 2.—Summary for All Establishments.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	1,386	$2,206,747	1,520	2,626	$1,029,018	$302,239	$2,104,484	$19,650	$2,009,677	$75,157	$4,794,829
Educational and eleemosynary institutions	3	11,910	.....	.....	.....	37	21,095	.....	20,901	194	30,853
Establishments with a product of less than $500	1,943	476,216	2,051	209	17,957	17,627	142,754	46,528	96,226	.....	389,911
All other establishments	3,029	53,513,191	3,560	30,459	11,847,884	3,631,275	40,528,329	14,205,634	24,470,358	1,852,337	69,382,852
Total	6,361	$56,208,064	7,131	33,294	$12,894,859	$3,951,178	$42,796,662	$14,271,812	$26,597,162	$1,927,688	$74,598,445

[1]Includes bicycle and tricycle repairing, 16; blacksmithing and wheelwrighting, 580; boots and shoes, custom work and repairing, 116; carpentering, 93; clothing, men's, custom work and repairing, 116; clothing, women's, dressmaking, 47; dyeing and cleaning, 9; furniture, cabinetmaking, repairing and upholstering, 43; lock and gun smithing, 5; masonry, brick and stone, 39; millinery, custom work, 127; painting, house, sign, etc., 43; paperhanging, 3; plastering and stuccowork, 12; plumbing, and gas and steam fitting, 46; sewing-machine repairing, 2; watch, clock and jewelry repairing, 89.

Of the 6361 establishments of all classes shown in this table, 3329, or 52.3 per cent., were small shops included in the groups of "hand trades" and "establishments with a product of less than $500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to $5,184,740, or 7 per cent. of the total products of the State.

In addition to the 6361 active establishments in the State during the census year, with a capital of $56,208,064, shown in Table 2, there were thirty-three idle establishments, with a capital of $868,450, divided as follows:

Industries.	No. of idle establishments.	Capital.
Brick and tile	4	$41,000
Explosives	1	68,200
Flouring and grist mill products	10	12,013
Fruits and vegetables, canning and preserving	1	10,250
Glass	5	335,720
Iron and steel	2	380,535
Leather, tanned, curried and finished	2	15,700
All other industries	8	5,032

TABLE 3.—COMPARATIVE SUMMARY OF TEN LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	2,060	$36,407,455	21,347	$8,636,943	$1,338,550	$29,414,149	$48,897,302
	1890	1,181	15,976,422	11,624	4,077,601	552,168	14,792,977	22,513,520
Increase, 1890 to 1900		879	$20,431,033	9,723	$4,559,342	$786,382	$14,621,172	$26,383,782
Per cent. of increase		74.4	127.9	83.6	111.8	142.4	98.8	117.2
Per cent. of total of all industries in State	1900	46.7	65.3	64.5	67.1	34.0	69.0	65.9
	1890	49.7	56.8	60.1	59.0	28.2	62.3	58.3
Cars and general shop construction and repairs by steam railroad companies	1900	23	$1,040,311	2,605	$1,256,640	$32,355	$1,586,916	$2,943,557
	1890	7	533,305	1,022	433,335	.....	467,841	910,393
Clay products: Total	1900	55	2,094,842	1,744	643,820	140,164	297,903	1,451,239
	1890	35	289,628	448	130,575	5,795	69,949	304,865
Brick and tile	1900	41	484,576	475	143,376	25,330	78,769	346,356
	1890	27	202,946	387	107,551	3,036	57,309	249,493
Pottery, terra-cotta and fire-clay products	1900	14	1,610,266	1,269	500,444	114,834	219,134	1,104,883
	1890	8	86,682	61	23,024	2,759	12,640	55,372
Coke	1900	77	4,452,579	3,131	890,024	226,603	1,966,682	3,529,241
	1890	45	1,716,837	1,034	284,375	53,310	709,576	1,130,762
Flouring and grist mill products	1900	737	2,126,470	314	154,623	55,972	4,555,003	5,541,353
	1890	496	1,767,003	545	140,959	64,298	3,228,786	3,902,990
Foundry and machine-shop products	1900	62	877,401	591	317,293	45,760	666,244	1,401,852
	1890	30	482,940	355	169,576	27,737	185,521	506,513
Glass	1900	16	1,338,084	1,949	789,422	112,791	593,251	1,871,785
	1890	7	825,313	1,371	511,079	40,805	277,033	945,234
Iron and steel	1900	11	8,202,910	4,467	2,293,524	225,165	10,422,322	16,514,212
	1890	7	4,215,097	2,013	1,098,489	102,624	5,606,883	7,490,924
Leather, tanned, curried and finished	1900	46	5,049,615	664	224,444	144,458	2,541,197	3,210,753
	1890	50	567,072	210	88,487	28,465	680,298	896,120
Lumber and timber products	1900	950	10,421,570	5,327	1,828,558	314,111	5,584,717	10,612,837
	1890	454	5,086,114	4,182	1,039,530	203,511	3,023,297	5,515,065
Lumber, planing-mill products, including sash, doors and blinds	1900	83	803,673	555	238,595	41,171	1,199,914	1,820,463
	1890	50	493,113	444	181,196	25,623	543,793	910,640

North Carolina.

The census figures are not at this date complete in detail for the State of North Carolina, but the figures here given will indicate the growth of the State generally during the decade from 1890 to 1900, and also for the leading manufacturing city of the State, Wilmington:

	1900.	1890.	Per cent. of increase.
Number of establishments	7,226	3,667	97.1
Capital	$76,503,894	$32,745,995	133.6
Wage-earners, average number	70,570	33,625	109.9
Total wages	$13,868,439	$6,552,121	111.7
Miscellaneous expenses	9,118,637	3,329,101	173.9
Cost of materials used	53,072,388	22,789,187	132.9
Value of products, including custom work and repairing	94,919,663	40,375,450	135.1

WILMINGTON.

	1900.	1890.	Per cent. of increase.
Number of establishments	124	121	2.5
Capital	$1,819,333	$1,752,667	3.8
Wage-earners, average number	1,469	1,358	8.2
Total wages	$446,413	$460,608	[1]3.1
Miscellaneous expenses	125,277	105,571	18.7
Cost of materials used	1,361,258	1,014,384	34.2
Value of products, including custom work and repairing	2,246,237	1,904,147	18.0

[1]Decrease.

North Carolina, one of the old agricultural States, has made satisfactory progress during the past twenty years in the direction of manufactures. The capital in 1880 invested in that State was $13,045,639, with an output of $20,695,037, compared to 7226 establishments in 1900, with a capital of $76,503,894 and an output of $94,919,663. The figures are not at hand showing the increase distributed according to the various industries of that State, but sufficient has been shown to indicate that North Carolina is alive to the possibility of her resources as a manufacturing State.

South Carolina.

The complete figures for the State of South Carolina by industries are not yet ready for publication. A preliminary report has been issued, however, showing the number of establishments, capital, etc., and a copy of the report is here set up. The report shows the situation so far as the whole State is concerned, and also the city of Charleston separate. The number of establishments has increased 58 per cent. during the ten years from 1890 to 1900. The capital, however, has increased 130 per cent., the wages 72.7 per cent., and the product 84 per cent., all of which is, no doubt, pleasing to the citizens of the "Old South State."

When the figures for this State are completed they will probably show a considerable increase in the growth of its cotton manufacturing industry.

The capital invested in manufacturing in the State of South Carolina has increased from $11,205,894 in 1880, with 2078 establishments, to $67,356,465 capital and 3762 establishments in 1900.

	1900.	1890.	Per cent. of increase.
Number of establishments	3,762	2,382	57.9
Capital	$67,356,465	$29,276,261	130.1
Wage-earners, average number	48,135	22,748	111.6
Total wages	$9,455,900	$5,474,739	72.7
Miscellaneous expenses	3,111,587	1,792,386	73.6
Cost of materials used	34,027,795	18,873,666	80.3
Value of products, including custom work and repairing	58,748,731	31,926,681	84.0

CHARLESTON.

	1900.	1890.	Per cent. of increase.
Number of establishments	364	566	[1]35.7
Capital	$12,473,187	$7,345,459	69.8
Wage-earners, average number	5,027	4,684	7.3
Total wages	$1,489,966	$1,779,789	[1]16.3
Miscellaneous expenses	796,573	464,172	71.6
Cost of materials used	5,633,578	4,753,396	18.5
Value of products, including custom work and repairing	9,562,387	9,005,421	6.2

[1]Decrease.

Georgia.

A complete bulletin has been issued by the Census Office on the manufactures of the State of Georgia. The table given below shows that in Georgia, although it is regarded as an agricultural State, there has been a steady growth in manufacturing industries during the half-century just passed. The population of the State of Georgia during these years increased from 906,185 to 2,216,331, or 144.6 per cent., but the average number of wage-earners employed in its manufacturing establishments increased from 8368 to 83,842, or 901.9 per cent., embracing in 1900 3.8 per cent. of the entire population, compared with nine-tenths of 1 per cent. in 1850. Probably the best indication of the importance of the wage-earning class is afforded by the greatest number employed at any one time during the year. In 1900 this was 111,239, or 5 per cent. of the total population of the State.

A distinct advance in manufactures has marked each decennial period, even between the trying period from 1860 to 1870. A great impetus was given manufacturing by the Cotton Exposition held at Atlanta in 1881. The increasing interest in manual training and technical education since 1887 has also contributed to the growth of Georgia's manufactures. The Georgia Institute of Technology was opened to students in 1887, and its graduates are actively engaged in manufacturing of various kinds with marked success. It is worthy of note that the increase in value of products is greatest—$37,737,507—during the decade ending with the census year 1900.

COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT. OF INCREASE FOR EACH DECADE.

	Date of Census. 1900.	1890.	1880.	1870.	1860.	1850.	Per Cent. of Increase. 1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
Number of establishments	7,504	4,285	3,593	3,836	1,890	1,522	75.1	19.3	[1]6.3	103.0	24.2
Capital	$89,789,656	$56,921,580	$20,672,410	$13,930,125	$10,890,875	$5,456,483	57.7	175.4	48.4	27.9	99.6
Salaried officials, clerks, etc., number	4,203	[2]4,085	(3)	(3)	(3)	(3)	2.9	....	....	....	....
Salaries	$3,354,946	[2]$2,688,200	(3)	(3)	(3)	(3)	24.8	....	....	....	....
Wage-earners, average number	83,842	52,298	24,875	17,871	11,575	8,368	60.3	110.2	39.2	54.4	38.3
Total wages	$20,290,071	$14,623,896	$5,266,152	$4,844,508	$2,925,148	$1,709,664	38.7	177.7	8.7	65.6	71.1
Men, sixteen years and over	66,540	42,779	18,937	15,078	9,492	6,650	55.5	125.9	25.6	58.8	42.7
Wages	$17,582,519	$12,976,291	(3)	(3)	(3)	(3)	25.5	....	....	....	....
Women, sixteen years and over	10,929	5,998	3,619	1,498	2,083	1,718	82.2	65.7	141.6	[1]28.1	21.2
Wages	$2,015,852	$1,298,806	(3)	(3)	(3)	(3)	55.2	....	....	....	....
Children, under sixteen years	6,373	3,521	2,319	1,295	(3)	(3)	81.0	51.8	79.1	....	....
Wages	$691,700	$348,899	(3)	(3)	(3)	(3)	98.3	....	....	....	....
Miscellaneous expenses	$5,321,330	$4,019,539	(4)	(4)	(4)	(4)	32.4	....	....	....	....
Cost of materials used	$58,232,202	$35,774,480	$24,143,939	$18,583,731	$9,986,532	$3,404,917	62.8	48.2	29.9	86.1	193.3
Value of products, including custom work and repairing	$106,654,527	$68,917,020	$36,440,948	$31,196,115	$16,925,564	$7,082,075	54.8	89.1	16.8	84.3	139.0
Total population	2,216,331	1,837,353	1,542,180	1,184,109	1,057,286	906,185	20.6	19.1	30.2	12.0	16.7
Wage-earners engaged in manufactures	83,842	52,298	24,875	17,871	11,575	8,368	60.3	110.2	39.2	54.4	38.3
Per cent. of total population	3.8	2.8	1.6	1.5	1.1	0.9	....	....	....	....	....
Assessed value of real estate	[3]$434,336,134	$225,054,915	$139,983,941	$143,948,216	$179,801,441	$121,619,739	93.0	60.8	[2]2.8	[1]19.9	47.8
Value of land and buildings invested in manufactures[5]	$24,283,038	$17,106,773	(3)	(3)	(3)	(3)	41.9	....	....	....	....
Per cent. of assessed value	5.6	7.6	.....	.....	.....	.....	....	....	....	....	....

[1]Decrease.
[2]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[3]Not reported separately.
[4]Not reported.
[5]As given in the Report of the Comptroller-General of the State of Georgia for 1900, page 4.
[6]Does not include value of rented property.

Table 2 divides the industries of the State into the hand trades and the manufactures proper. This table also gives the statistics for one governmental establishment, one eleemosynary institution, and establishments with a product of less than $500. These were not reported at previous censuses, and therefore are omitted from the other tables and their use confined to Table 2:

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	1,631	$1,713,164	1,838	3,822	$1,317,016	$243,539	$2,778,299	$2,950	$2,703,392	$71,957	$5,822,990
Governmental establishment	1	125	....	1	540	.....	29	.....	24	5	569
Eleemosynary institution	1	1,200	....	1	150	.....	2,415	2,400	15	.....	2,800
Establishments with a product of less than $500	5,670	2,524,756	6,319	7,703	173,695	61,487	305,028	63,086	241,952	.....	1,209,156
All other establishments	5,873	88,076,492	6,990	80,020	18,973,055	5,077,791	55,453,903	26,634,232	25,796,524	3,023,147	100,831,537
Total	13,176	$92,315,737	15,147	91,547	$20,464,456	$5,382,817	$58,539,684	$26,702,668	$28,741,907	$3,095,109	$107,867,052

[1]Includes bicycle and tricycle repairing, 58; blacksmithing and wheelwrighting, 621; boots and shoes, custom work and repairing, 169; carpentering, 87; clothing, men's, custom work and repairing, 73; clothing, women's, dressmaking, 89; dyeing and cleaning, 24; furniture, cabinetmaking, repairing and upholstering, 42; lock and gun smithing, 19; masonry, brick and stone, 30; millinery, custom work, 181; painting, house, sign, etc., 47; paperhanging, 5; plumbing, and gas and steam fitting, 56; sewing-machine repairing, 4; typewriter repairing, 3; watch, clock and jewelry repairing, 123.

Of the 13,176 establishments of all classes shown in this table, 7301, or 55.4 per cent., were small shops included in the groups of "hand trades" and "establishments with a product of less than $500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to $7,032,146, or only 6.5 per cent. of the total products of the State. In addition to the 13,176 active establishments in the State during the census year, with a capital of $92,315,737, shown in Table 2, there were 103 idle establishments, with a capital of $1,117,076, divided as follows:

Industries.	No. of idle establishments.	Capital.	Industries.	No. of idle establishments.	Capital.
Brick and tile	7	$5,907	Ice, artificial	1	$4,000
Chemicals	1	150,000	Iron and steel	3	599,300
Cotton, ginning	40	26,782	Kaolin and other earth grinding	1	29,000
Fertilizers	1	32,500	Lumber and timber products	28	81,509
Flouring and grist mill products	7	7,965	Lumber, planing-mill products, including sash, doors and blinds	1	25,000
Foundry and machine-shop products	1	44,000	Paving and paving materials	2	10,176
Fruits and vegetables, canning and preserving	1	9,100	Roofing and roofing materials	1	54,500
Hosiery and knit goods	1	25,000	All other industries	7	12,337

TABLE 3.—COMPARATIVE SUMMARY OF NINE LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	3,301	$61,341,596	61,170	$14,059,303	$2,731,378	$41,893,194	$72,715,693
	1890	1,673	38,425,143	34,494	8,561,945	1,992,578	24,060,378	41,763,950
Increase, 1890 to 1900	....	1,628	$22,916,453	26,676	$5,497,358	$738,800	$17,832,816	$30,951,743
Per cent. of increase	....	97.3	59.6	77.3	64.2	37.1	74.1	74.1
Per cent. of total of all industries in State	1900	44.0	68.3	73.0	69.3	51.3	71.9	68.2
	1890	39.0	67.5	66.0	58.5	49.6	67.3	60.6
Cars and general shop construction and repairs by steam railroad companies	1900	32	$1,408,592	3,175	$1,602,208	$89,380	$1,272,692	$3,062,283
	1890	11	450,512	966	522,657	.....	349,844	892,610
Fertilizers	1900	41	6,663,618	1,126	294,887	405,936	2,349,635	3,367,353
	1890	44	5,501,881	1,264	326,011	468,599	3,098,883	5,026,034
Flouring and grist mill products	1900	1,123	2,504,033	1,167	225,933	73,455	7,004,065	8,330,439
	1890	719	2,347,835	1,078	197,964	103,985	4,356,700	5,190,311
Foundry and machine-shop products	1900	87	3,398,141	2,384	920,331	173,903	1,590,884	3,506,427
	1890	52	2,107,969	1,632	732,301	124,362	753,299	2,272,653
Lumber and timber products	1900	1,254	11,802,716	10,240	2,344,523	249,636	6,665,897	13,704,923
	1890	449	5,019,635	5,943	1,533,217	228,279	3,304,249	6,545,195
Lumber, planing-mill products, including sash, doors and blinds	1900	99	2,074,226	2,171	672,243	102,159	2,280,495	4,302,976
	1890	82	1,677,880	2,157	851,290	126,193	1,907,370	3,548,972
Oil, cottonseed and cake	1900	43	4,098,668	1,591	354,017	312,986	6,229,436	8,064,112
	1890	17	992,131	751	145,557	86,843	1,289,421	1,670,196
Turpentine and rosin	1900	524	3,785,432	19,199	3,772,848	178,774	2,292,665	8,110,468
	1890	228	2,242,592	9,889	1,998,186	108,003	1,001,686	4,242,255
Textiles: Total	1900	98	25,606,170	20 117	3,872,313	1,145,149	12,207,425	20,266,712
	1890	71	18,084,708	10 814	2,254,162	746,314	7,908,926	12,375,724
Cotton goods (including cotton small wares)	1900	68	24,,22,,69	18,348	3,574,492	1,050,088	11,169,700	18,544,910
	1890	53	17,,64,675	10,314	2,167,036	724,822	7,832,230	12,035,629
Hosiery and knit goods	1900	16	928,887	1,208	200,662	72,631	757,430	1,230,801
	1890	4	121,494	338	64,092	10,665	70,697	166,850
Woolen goods	1900	14	455,114	561	97,159	22,430	280,295	491,001
	1890	14	298,539	162	23,034	10,887	95,999	173,245

The figures in Table 3 show that the nine leading industries embraced in 3301 establishments, or 44 per cent. of the total number in the State, used a capital of $61,341,596, or 68.3 per cent. of the total, and gave employment to 61,170 wage-earners, or 73 per cent. of the total number. The manufacture of cotton goods is the most important industry of the State. The sixty-eight establishments reported in 1900 gave employment to 18,348 wage-earners, or 21.9 per cent. of the wage-earners employed in the State. A table is subjoined hereto showing the condition of the manufacturing industries in the four leading cities of Georgia, namely, Atlanta, Augusta, Macon and Savannah:

TABLE 4.—COMPARATIVE SUMMARY, ATLANTA, AUGUSTA, MACON AND SAVANNAH, 1890 AND 1900, WITH PER CENT. OF INCREASE.

	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
The State	1900	7,504	$89,789,656	83,842	$20,290,071	$5,321,330	$58,232,202	$106,65,,527
	1890	4,285	56,921,580	52,298	14,623,996	4,019,539	35,774,480	68,,17,020
Per cent. of increase	....	75.1	57.7	60.3	38.7	32.4	62.8	54.8
Atlanta	1900	395	$16,085,114	9,368	$3,106,039	$1,352,721	$8,571,194	$16,721,899
	1890	410	9,508,962	7,957	3,206,285	987,623	5,914,571	13,074,037
Per cent. of increase	....	[1]3.7	69.2	17 7	[1]3.1	37.0	44.9	27.9
Augusta	1900	388	9,016,619	7,138	1,815,879	618,938	6,244,286	10,069,750
	1890	440	7,770,688	5,714	1,689,941	526,539	5,430,871	9,244,850
Per cent. of increase	....	[1]11.8	16.0	24.9	7.5	17.5	15.0	8.9
Macon	1900	182	5,076,005	3,709	1,047,437	445,078	3,741,167	6,495,767
	1890	203	3,988,900	3,157	1,057,041	219,988	2,664,498	5,171,530
Per cent. of increase	....	[1]10.3	27.3	17.2	[1]0.9	102.3	40.4	25.6
Savannah	1900	155	5,716,491	2,870	1,176,120	469,918	3,915,884	6,461,816
	1890	244	5,379,774	2,419	1,059,348	484,497	3,297,804	6,319,066
Per cent. of increase	....	[1]36.5	6.3	18.6	11.0	[1]3.0	18.7	2.3
Total for four cities	1900	1,120	$35,894,229	23,076	$7,145,595	$2,886,655	$22,472,531	$39,749,232
	1890	1,297	26,648,324	19,247	7,012,615	2,218,647	17,307,744	33,809,483
Per cent. of increase	....	[1]13.6	34.7	19.9	1.9	30.1	29.8	17.6
Per cent. of four cities to total for State	1900	14.9	40.0	27.5	35.2	54.2	38.6	37.3
	1890	30.3	46.8	36.8	48.0	55.2	48.4	49.1

[1]Decrease.

The number of establishments in the city of Atlanta decreased 3.7 per cent., yet the capital invested increased 69 per cent. In Augusta the number of establishments decreased almost 12 per cent., yet the capital increased almost $1,250,000, or 16 per cent. In Macon the number of establishments in 1890 was 203; in 1900, 182—a decrease of about 10 per cent. The capital invested increased 27.3 per cent. during the same period. In Savannah the number of establishments decreased from 244 in 1890 to 155 in 1900, but an increase of 6.3 per cent. in the capital invested. The number of establishments in the four cities named decreased from 1297 to 1120, or 13.6 per cent., yet the statistics show an increase in the capital invested in the four cities named of 34.7 per cent. In value of products Atlanta shows an increase of 27.9 per cent.; Augusta, 8.9 per cent; Macon, 25.6 per cent., and Savannah a little over 2 per cent. Savannah, it will be noted, fails to make as good a showing as her sister cities.

The first table in this article shows that the State of Georgia accomplished much in the way of developing her manufacturing resources in the past twenty years. In 1880 the capital invested in 3593 establishments was $20,672,410; in 1900, $89,789,656, representing 7504 establishments.

The growth of the cotton manufactures in Georgia has attracted considerable attention in the North. Stimulated, in the first instance, by abundant raw material, it has also, in some instances, been encouraged by municipal exemption from taxation, while railroad companies, chambers of commerce and other agencies have done much to attract capital to the industry from a distance. Cotton manufacturers of Massachusetts, New York and Pennsylvania are now represented in the city by large mills recently constructed in Floyd and Polk counties. Home capital has also been attracted by the profits of the industry and by the salutary effect of the distribution of wages through the channels of trade. Cotton factories have benefited the farmers by providing a strong local market for cotton and a better demand for farm products, and the farmers are thus enabled to join with the business men as subscribers for the capital stock of new corporations.

Another industry dependent upon the large cotton crop of the State is the manufacture of cottonseed oil and cake. The products of these mills include cottonseed meal, as well as oil and cake. Much of this meal is sold for the manufacture of fertilizers.

Other important industries of the State are the manufacture of lumber and timber products, the manufacture of turpentine and rosin, flour and grist milling, planing-mill industry, foundry and machine shops, etc. Our agents report that the turpentine and rosin industry seems doomed to early extinction unless some system of forestry is adopted to preserve the pine forests.

Wherever a saw-mill has been in operation for a considerable length of time the land is practically denuded of timber. The destruction is made more complete by the operation of turpentine farmers, who box and drain the sap of young trees which would not be worth hauling to a saw-mill, and by disastrous forest fires. It has been suggested that a system of forestry should be adopted by the State to preserve this important industry, in which during 1900 there were 524 establishments engaged, with 19,199 wage-earners and products valued at $8,110,468.

There were thirty-two establishments engaged in the construction of repair-shop work of steam railroads in 1900, with 3175 wage-earners and products valued at $3,062,283; for 1890 there were eleven establishments reported, with 966 wage-earners and products valued at $892,610.

The increase in the value of products during the decade was $2,169,673, or 243.1 per cent. This increase reflects considerable improvement in the condition of the railroads, for in 1894 three-fourths of the mileage of the State was in the hands of receivers.

Florida.

The State of Florida shows a magnificent increase in the development of its manufacturing resources in 1900 over its record for 1890, as will be noted by perusal of the comparative summary given below:

TABLE 1.—COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT. OF INCREASE FOR EACH DECADE.

	Date of Census.						Per Cent. of Increase.				
	1900.	1890.	1880.	1870.	1860.	1850.	1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
Number of establishments	2,115	805	426	259	185	103	162.7	89.0	[1]35.1	256.2	79.6
Capital	$34,473,997	$11,110,304	$3,210,680	$1,679,930	$1,874,125	$547,069	210.3	246.0	91.1	[1]10.4	242.6
Salaried officials, clerks, etc., number	1,918	808	[2]	[2]	[2]	[2]	137.4	....	....	....	....
Salaries	$1,354,211	[3]$594,454	[2]	[2]	[2]	[2]	127.8	....	....	....	....
Wage-earners, average number	37,094	13,119	5,504	2,749	2,454	991	182.8	138.4	100.2	12.0	147.6
Total wages	$11,359,367	$5,918,614	$1,270,875	$989,592	$619,840	$199,452	91.9	365.7	28.4	59.7	210.8
Men, sixteen years and over	35,052	11,539	4,564	2,670	2,297	876	203.8	152.8	70.9	16.2	162.2
Wages	$10,858,319	$5,462,984	[2]	[2]	[2]	[2]	98.8	....	....	....	....
Women, sixteen years and over	1,668	1,312	558	20	157	115	27.1	135.1	2,690.0	[1]87.3	36.5
Wages	$455,906	$424,555	[2]	[2]	[2]	[2]	7.4	....	....	....	....
Children, under sixteen years	374	268	282	59	.....	.....	39.6	[1]29.8	547.5	....	....
Wages	$45,142	$31,075	[2]	[2]	....	....	45.3	....	....	....	....
Miscellaneous expenses	$2,411,539	$1,131,067	[4]	[4]	[4]	[4]	113.2	....	....	....	....
Cost of materials used	$15,786,526	$8,021,854	$3,040,119	$2,330,873	$874,506	$220,611	96.8	163.9	30.4	166.5	296.4
Value of products, including custom work and repairing	$38,189,894	$18,222,890	$5,546,448	$4,685,403	$2,447,969	$668,335	109.6	228.6	18.4	91.4	266.3
Total population	528,542	391,422	269,493	187,748	140,424	87,445	35.0	45.2	43.5	33.7	60.6
Wage-earners engaged in manufactures	37,094	13,119	5,504	2,749	2,454	991	182.8	138.4	100.2	12.0	147.6
Per cent. of total population	7.0	3.4	2.0	1.5	1.7	1.1	....	....	....	....	....
Assessed value of real estate	[5]$79,688,902	$60,596,574	$18,885,151	$20,197,691	$21,722,810	$7,924,588	31.5	220.9	[1]6.5	[1]7.0	174.1
Value of land and buildings invested in manufactures	[6]$14,674,589	$3,514,648	[7]	[7]	[7]	[7]	317.5	....	....	....	....
Per cent. of assessed value	18.4	5.8	.....	.....	.....	.....	....	....	....	....	....

[1]Decrease.
[2]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[3]Not reported separately.
[4]Not reported.
[5]As given for the year 1900 in the Annual Report of the Comptroller of the State of Florida.
[6]Does not include the value of rented property.
[7]Figures not accessible.

In fifty years the capital invested in manufacturing has increased from $547,000 to $34,473,997. The apparent decrease in the number of establishments reported between 1870 and 1880 is due partly to the inclusion in 1870 of sugar and molasses manufactured on the plantation—a branch of sugar manufacture excluded in 1880—and partly to the imperfect enumeration of the hand trades in 1870 and 1880. During the last decade the total value of the manufactures of the State more than doubled, and the number of wage-earners employed increased 183 per cent. In addition to the 2732 active establishments in the State during the census year, with a capital of $34,679,691, shown in Table 2, given below, there were twenty-nine idle establishments, with a capital of $524,379:

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Cost of Materials Used. Purchased in raw state.	Cost of Materials Used. Purchased in partially manufactured form.	Cost of Materials Used. Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	443	$656,949	497	992	$433,456	$75,296	$859,362	$4,494	$826,912	$27,956	$1,809,525
Educational institutions	2	575	.....	.....	.....	.....	404	.....	356	48	795
Establishments with a product of less than $500	615	205,119	632	494	12,222	12,909	49,285	.....	49,075	210	135,458
All other establishments	1,672	33,817,048	2,082	36,102	10,925,911	2,336,243	14,927,164	6,388,194	8,127,897	411,073	36,380,369
Total	2,732	$34,679,691	3,211	37,588	$11,371,589	$2,424,448	$15,836,215	$6,392,688	$9,004,240	$439,287	$38,326,147

[1]Includes bicycle and tricycle repairing, 54; blacksmithing and wheelwrighting, 95; boots and shoes, custom work and repairing, 43; carpentering, 38; clothing, men's, custom work and repairing, 49; clothing, women's, dressmaking, 15; dyeing and cleaning, 4; furniture, cabinetmaking, repairing and upholstering, 10; lock and gun smithing, 4; masonry, brick and stone, 8; millinery, custom work, 41; painting, house, sign, etc., 7; plumbing, and gas and steam fitting, 26; sewing-machine repairing, 2; taxidermy, 1; watch, clock and jewelry repairing, 46.

One of the establishments, with a capital of $100,000, was reported for the manufacture of fertilizers; twelve, with a combined capital of $269,330, for the manufacture of lumber and timber; one, with a capital of $40,000, for the manufacture of paper, and one, with a capital of $85,000, for the manufacture of starch. The remaining idle capital, amounting to $30,049, was invested in comparatively small establishments reported for various industries. The 1058 shops designated as hand trades and establishments with a product of less than $500 embraced more than one-third of the number reported for the entire State, while the capital invested, wages paid, and the value of the products form but 3, 4 and 5 per cent. of the total for these items, respectively. A comparative summary is here given showing the seven leading industries of the State:

TABLE 3.—COMPARATIVE SUMMARY OF SEVEN LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	1,104	$29,016,399	33,101	$9,920,650	$2,100,229	$13,074,984	$32,059,820
	1890	431	8,010,430	10,960	5,142,613	964,560	6,448,255	14,905,966
Increase, 1890 to 1900		673	$21,005,969	22,141	$4,778,037	$1,135,769	$6,626,729	$17,153,864
Per cent. of increase		156.1	262.2	202.0	92.9	117.7	102.8	115.1
Per cent. of total of all industries in State	1900	52.2	84.2	89.2	87.3	87.1	82.8	83.9
	1890	53.5	72.1	83.5	86.9	85.3	80.4	81.8
Cars and general shop construction and repairs by steam railroad companies	1900	13	$414,330	958	$486,488	$19,224	$579,870	$1,112,245
	1890	10	158,960	280	144,997	1,800	201,514	354,043
Fertilizers	1900	7	733,369	117	39,961	34,030	330,649	555,394
	1890	3	14,705	23	4,305	1,059	74,075	86,137
Lumber and timber products	1900	416	14,937,693	7,081	2,197,875	486,706	5,725,887	10,848,403
	1890	215	5,438,366	4,363	1,289,276	274,213	2,745,016	5,514,879
Printing and publishing	1900	100	538,743	406	179,758	39,299	155,317	603,410
	1890	86	435,855	468	204,719	76,002	122,122	567,808
Shipbuilding	1900	15	149,159	141	73,509	7,185	111,111	254,901
	1890	16	93,156	69	29,881	2,083	21,702	68,020
Tar and turpentine	1900	425	6,893,138	17,937	3,725,529	249,669	1,371,938	7,794,101
	1890	15	182,992	484	93,269	5,520	45,865	191,859
Tobacco, cigars and cigarettes	1900	128	5,349,907	6,461	3,217,530	1,264,216	4,800,212	10,891,286
	1890	86	1,686,386	5,273	3,376,166	603,883	3,237,961	8,123,220

The most valuable natural resource of Florida is its forests, estimated to cover 25,000,000 acres, and composed largely of pitch pine, from which turpentine is produced, and live oak, used largely for shipbuilding. The value of the products of the industries dependent upon the forests of the State—lumber and timber products, including tar and turpentine and shipbuilding—amounted to $18,897,495, or 49 per cent. of the total value of the manufactured products in 1900. There were 871,209,000 feet of lumber, board measure, exclusive of custom sawing, cut in the saw-mills of the State during the year, valued at $8,452,792. The total value of the products in 1900, including certain planing-mill operations carried on in connection with the saw-mills, and including the amount received for custom work, was $10,848,403, as compared with $5,514,879 in 1890, an increase of 97 per cent. The average number of wage-earners engaged in the industry increased from 4363 in 1890 to 7081 in 1900, or 62 per cent. The industry is carried on chiefly in the northwestern part of the State, and the mills of this region use large quantities of timber cut in the forests of Georgia. The manufacture of tar and turpentine is practically a growth of the last decade, the product in 1890 being valued at but $191,857, as compared with $7,794,101 in 1900. This product consisted chiefly of turpentine, 292,617 barrels, valued at $5,760,631, and rosin, 934,011 barrels, valued at $1,980,359. Shipbuilding, favored by a supply of considerable lumber, gave employment to 141 wage-earners in 1900 and an output valued at $254,901. This latter is over three times the value of the product reported for 1890.

The tobacco industry is also one of the leading items of interest to the people of Florida. The business of the tobacco manufacture in Florida grows largely out of Cuban immigration. Most of the manufacturers use Havana tobacco entirely, the imports of tobacco leaf into the port of Tampa alone exceeding those of any other port in the United States except New York. In the year 1899-1900, while the imports into the ports of the State constituted over one-tenth of the total imports of tobacco leaf into the country, the census figures show that an average of 6461 wage-earners were employed in 1900, as compared with 5273 in 1890, and a product valued at $10,891,286 in 1900, as compared with $8,123,220 in 1890.

The foregoing table (Table 3) will give the figures for the three remaining leading industries of the State, so it is unnecessary to give them special mention here.

The city of Jacksonville, before the fire in 1901, had 195 establishments, with a capital of $2,068,663, with a total product in 1900 of $2,312,209. Just how many of the establishments in the city of Jacksonville were wiped out by the fire the writer is not advised. Even if the entire number were destroyed, it would not affect materially the capital which is shown to be invested in

manufactures in Florida, namely, over $34,473,997, in 1900, as against $10,000,000, in round numbers, in 1890.

The people of Florida have no reason to complain of the growth of their State in the direction of manufactures during the last ten years.

Kentucky.

Only a preliminary bulletin has been issued for the State of Kentucky, and the total figures for that State are, and some of their leading cities, reported separately. The State as a whole shows a gratifying increase in its manufactures, but three of the cities show a decrease. The city of Covington shows the greatest falling off. As the reports are not complete for these cities, it is not possible to account in detail for the various decreases shown.

	1900.	1890.	Per cent. of increase.
Number of establishments	9,560	7,745	23.4
Capital	$104,070,791	$79,811,980	30.0
Wage-earners, average number	62,962	56,558	11.3
Total wages	$22,434,185	$21,326,831	5.2
Miscellaneous expenses	19,581,630	15,879,728	23.3
Cost of materials used	82,773,415	63,677,583	30.0
Value of products, including custom work and repairing	154,605,115	126,719,857	22.0

Covington.	1900.	1890.	Per cent. of increase.
Number of establishments	403	1,308	[1]69.2
Capital	$4,729,786	$6,897,380	[1]31.4
Wage-earners, average number	3,898	6,111	[1]36.2
Total wages	$1,539,089	$2,956,263	[1]47.9
Miscellaneous expenses	832,705	1,026,579	[1]18.9
Cost of materials used	2,983,976	8,228,079	[1]63.7
Value of products, including custom work and repairing	6,610,082	15,999,575	[1]58.7

[1]Decrease.

Lexington.	1900.	1890.	Per cent. of increase.
Number of establishments	271	183	48.1
Capital	$1,532,378	$1,619,880	[1]5.4
Wage-earners, average number	1,441	1,279	12.7
Total wages	$545,118	$550,026	[1]0.9
Miscellaneous expenses	224,916	124,915	80.1
Cost of materials used	1,467,515	1,256,739	16.8
Value of products, including custom work and repairing	2,925,697	2,708,445	8.0

[1]Decrease.

Louisville.	1900.	1890.	Per cent. of increase.
Number of establishments	2,307	1,700	35.7
Capital	$49,334,701	$36,086,985	36.7
Wage-earners, average number	29,926	24,159	23.9
Total wages	$10,945,720	$9,844,468	11.2
Miscellaneous expenses	13,145,595	6,250,230	110.3
Cost of materials used	41,016,391	28,033,840	46.3
Value of products, including custom work and repairing	79,286,390	54,515,226	45.4

Newport.	1900.	1890.	Per cent. of increase.
Number of establishments	272	1,002	[1]72.9
Capital	$2,848,435	$3,471,388	[1]17.9
Wage-earners, average number	2,561	3,776	[1]32.2
Total wages	$1,155,361	$1,692,177	[1]31.7
Miscellaneous expenses	866,620	335,404	158.4
Cost of materials used	2,017,773	3,072,313	[1]34.3
Value of products, including custom work and repairing	4,888,169	6,687,987	[1]26.9

[1]Decrease.

Tennessee.

A preliminary report for the State of Tennessee is given below:

	1900.	1890.	Per cent. of increase.
Number of establishments	8,009	4,559	75.7
Capital	$71,222,680	$51,475,092	38.4
Wage-earners, average number	50,274	37,487	34.1
Total wages	$16,545,034	$13,557,180	22.0
Miscellaneous expenses	6,174,164	4,126,271	49.6
Cost of materials used	63,404,886	40,463,782	56.7
Value of products, including custom work and repairing	107,527,060	72,355,286	48.6

Chattanooga.	1900.	1890.	Per cent. of increase.
Number of establishments	330	294	12.2
Capital	$7,642,695	$7,405,646	3.2
Wage-earners, average number	5,336	5,200	2.6
Total wages	$1,825,233	$2,246,523	[1]18.8
Miscellaneous expenses	750,387	909,518	[1]17.5
Cost of materials used	7,044,067	4,937,902	42.7
Value of products, including custom work and repairing	11,628,800	10,216,109	13.8

[1]Decrease.

Knoxville.	1900.	1890.	Per cent. of increase.
Number of establishments	218	205	6.3
Capital	$5,151,130	$3,045,661	69.1
Wage-earners, average number	4,714	2,746	71.7
Total wages	$1,473,543	$1,355,566	8.7
Miscellaneous expenses	306,795	261,707	17.2
Cost of materials used	3,877,772	2,464,914	57.3
Value of products, including custom work and repairing	6,943,595	5,020,116	38.3

Memphis.	1900.	1890.	Per cent. of increase.
Number of establishments	658	345	90.7
Capital	$11,179,024	$9,357,821	19.5
Wage-earners, average number	8,428	5,497	53.3
Total wages	$3,638,278	$2,542,264	43.1
Miscellaneous expenses	1,077,657	813,951	32.4
Cost of materials used	9,592,422	7,090,190	35.3
Value of products, including custom work and repairing	17,848,530	13,244,538	34.8

Nashville.	1900.	1890.	Per cent. of increase.
Number of establishments	488	420	16.2
Capital	$13,150,137	$9,904,295	32.8
Wage-earners, average number	8,398	7,275	15.4
Total wages	$2,882,111	$3,052,444	[1]5.6
Miscellaneous expenses	1,436,544	681,619	110.8
Cost of materials used	10,390,573	7,994,751	30.0
Value of products, including custom work and repairing	18,367,323	14,590,823	25.9

[1]Decrease.

There are but three decreases reported in the State of Tennessee, being 18 per cent. decrease in the total wages paid in Chattanooga, 17 per cent. in miscellaneous expenses. There is also 5 per cent. decrease in the total wages paid in Nashville. The other figures for the entire State and cities reported show that the State of Tennessee is keeping pace with her sister States in the matter of industrial development.

In the matter of iron and steel industries it does not show such a satisfactory increase as in other lines. By looking at the table for the iron and steel industries for the past three census years, which is set forth below, it will be noted that in 1880 the State of Tennessee had forty-three establishments, representing a capital of $3,681,776, with 3077 wage-earners. In 1890 the number of establishments had decreased to fifteen, the capital had increased to $4,613,355, and the wage-earners reduced to 1472. In the census year 1900 sixteen establishments were reported, with a capital of $5,381,165, with 1979 workers. It will thus be seen that not much progress has been made in this division of the State's enterprise.

Alabama.

One of the Southern States that has done much toward utilizing her advantages as a manufacturing State is Alabama. The summary below shows that the capital invested in that State has increased during the past fifty years from $3,000,000, in round numbers, to over $70,000,000. The increase in the number of establishments from 1890 to 1900 was 88 per cent., and the increase in capital invested was about 53 per cent.

TABLE 1.—COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT. OF INCREASE FOR EACH DECADE.

	Date of Census.						Per Cent. of Increase.				
	1900.	1890.	1880.	1870.	1860.	1850.	1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
Number of establishments	5,602	2,977	2,070	2,188	1,459	1,026	88.2	43.8	[1]5.4	50.0	42.2
Capital	$70,370,081	$46,122,571	$9,668,008	$5,714,032	$9,098,181	$3,450,606	52.6	377.1	69.2	[1]37.2	163.7
Salaried officials, clerks, etc., number	2,530	[2]2,684	[3]	[3]	[3]	[3]	[1]5.7	....	....	....	....
Salaries	$2,168,671	[2]$1,876,282	[3]	[3]	[3]	[3]	15.6	....	....	....	....
Wage-earners, average number	52,902	31,137	10,019	8,248	7,889	4,936	69.9	210.8	21.5	4.6	59.8
Total wages	$15,130,419	$10,799,747	$2,500,504	$2,227,968	$2,132,940	$1,105,824	40.1	331.9	12.2	4.5	92.9
Men, sixteen years and over	45,530	27,848	8,368	7,196	6,792	4,397	63.5	232.8	16.3	5.9	54.5
Wages	$14,073,456	$10,231,041	[3]	[3]	[3]	[3]	37.6	....	....	....	....
Women, sixteen years and over	3,898	1,864	842	664	1,097	539	109.1	121.4	26.8	[1]39.5	103.5
Wages	$704,099	$416,610	[3]	[3]	[3]	[3]	69.0	....	....	....	....
Children, under sixteen years	3,474	1,425	809	388	[3]	[3]	143.8	76.1	108.5	....	....
Wages	$352,864	$152,096	[3]	[3]	[3]	[3]	132.0	....	....	....	....
Miscellaneous expenses	$3,828,402	$2,797,896	[4]	[4]	[4]	[4]	36.8	....	....	....	....
Cost of materials used	$46,151,026	$28,432,281	$8,545,520	$7,592,837	$5,489,963	$2,224,960	62.3	232.7	12.5	38.3	146.7
Value of products, including custom work and repairing	$82,793,804	$51,226,605	$13,565,504	$13,040,644	$10,588,566	$4,528,876	61.6	277.6	4.0	23.2	133.8
Total population	1,828,697	1,513,017	1,262,505	996,992	964,201	771,623	20.9	19.8	26.6	3.4	25.0
Wage-earners engaged in manufactures	52,902	31,137	10,019	8,248	7,889	4,936	69.9	210.8	21.5	4.6	59.8
Per cent. of total population	2.9	2.1	0.8	0.8	0.8	0.6	....	....	....	....	....
Assessed value of real estate	[5]$158,390,273	$154,706,484	$77,374,008	$117,223,043	$155,034,089	$78,870,718	2.4	99.9	[1]34.0	[1]24.4	96.6
Value of land and buildings invested in manufactures[6]	$24,978,473	$12,709,521	[4]	[4]	[4]	[4]	96.5	....	....	....	....
Per cent. of assessed value	15.8	8.2	.....	.....	.....	.....	....	....	....	....	....

[1]Decrease.
[2]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[3]Not reported separately.
[4]Not reported.
[5]As given for the year 1900 in the Annual Report of the Auditor of the State of Alabama.
[6]Does not include the value of rented property.

The population increased during these years from 771,623 to 1,828,697, or 137 per cent., while the average number of wage-earners employed in manufacturing establishments increased from 4936 to 52,902, or 971.8 per cent. This growth of the wage-earning class has been very marked in the last two decades, and particularly in the decade 1880 to 1890, when the increase was 210.8 per cent., as compared with an increase of 19.8 per cent. in total population. In 1900 the average number of wage-earners in manufactures constituted 2.9 per cent. of the total population, as compared with eight-tenths of 1 per cent. in 1880. But probably the best indication of the importance of the wage-earning class is afforded by the greatest number employed at any one time during the year. In 1900 this was 76,931, or 4.2 per cent. of the total population of the State.

The rapid growth of the manufacturing industries of Alabama during the last twenty-five years is due to the utilization of the State's rich mineral resources, which were neglected in the earlier years of the century. The development of the iron industry and of coal mining has stimulated a variety of manufactures which are centered in the Birmingham district, in the northern part of the State, where the mineral deposits exist. The abundance of coal has made unnecessary any extensive use of the water-power of the State on the Coosa, Tennessee and Tallapoosa rivers, although on the Tallapoosa, near Montgomery, one of the largest water-power plants in the South has recently been constructed. It is noteworthy that the great development of manufactures in the northern part of the State has taken place largely without the advantage of navigable water for the cheap shipment of products. For years efforts have been made to connect the Birmingham district with tidewater at Mobile bay by means of a canal and the construction of locks on the Warrior river. Of the five locks projected, three were completed in 1895, and a route for the canal has been surveyed by engineers of the United States. It is estimated that water communication with Mobile would reduce freight charges on iron 80 per cent.

Table 2 divides the industries of the State between the hand trades and the manufactures proper. This table also gives the statistics for educational, eleemosynary and penal institutions, and establishments with a product of less than $500. These were not reported at previous censuses, and are, therefore, omitted from the other tables and their use confined to Table 2.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	1,091	$1,498,856	1,288	2,809	$988,951	$182,430	$1,907,871	$6,114	$1,846,356	$55,401	$4,263,882
Educational, eleemosynary and penal institutions	10	135,456	1	83	8,522	352	59,567	26,193	27,920	5,454	92,588
Establishments with a product of less than $500.	7,951	1,980,912	8,665	7,718	242,558	49,359	345,908	106,965	238,943	.....	1,128,755
All other establishments	4,511	68,871,225	5,456	50,093	14,141,468	3,645,972	44,243,155	17,766,822	19,997,818	6,478,515	78,529,932
Total	13,563	$72,486,449	15,410	60,703	$15,381,499	$3,878,113	$46,556,501	$17,906,094	$22,111,037	$6,539,370	$84,015,117

[1]Includes bicycle and tricycle repairing, 35; blacksmithing and wheelwrighting, 452; boots and shoes, custom work and repairing, 118; carpentering, 73; clothing, men's, custom work and repairing, 54; clothing, women's, dressmaking, 19; dyeing and cleaning, 16; furniture, cabinetmaking, repairing and upholstering, 19; lock and gun smithing, 14; masonry, brick and stone, 14; millinery, custom work, 110; painting, house, sign, etc., 16; paperhanging, 2; plastering and stuccowork, 1; plumbing, and gas and steam fitting, 47; sewing-machine repairing, 6; typewriter repairing, 3; watch, clock and jewelry repairing, 92.

Of the 13,563 establishments of all classes shown in this table, 9042, or 66.7 per cent., were small shops included in the groups of "hand trades" and "establishments with a product of less than $500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to $5,392,587, or only 6.4 per cent. of the total products of the State. In addition to the 13,563 active establishments in the State during the census year, with a capital of $72,486,449, shown in Table 2, there were 121 idle establishments, with a capital of $3,388,916, divided as follows:

Industries.	No. of idle establishments.	Capital.
Brick and tile	7	$10,285
Coke	1	20,000
Flouring and grist mill products	8	11,207
Foundry and machine-shop products	1	84,499
Hardware	1	37,700
Iron and steel	12	2,966,889
Leather, tanned, curried and finished	5	$3,700
Lumber and timber products	31	120,305
Lumber, planing-mill products, including sash, doors and blinds	3	37,160
Pottery, terra-cotta and fire-clay products	3	65,700
All other industries	49	31,471

The eleven leading industries of the State in 1900, as shown in Table 3, embraced 3335 establishments, or 59.5 per cent. of the total number in the State; used a capital of $57,809,426, or 82.2 per cent. of the total; gave employment to 37,347 wage-earners, or 70.6 per cent. of the total number, and paid in wages $10,657,960, or 70.4 per cent. of the total. The value of their products was $62,382,686, or 75.3 per cent. of the total value of the products in the State.

TABLE 3.—COMPARATIVE SUMMARY OF ELEVEN LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	3,335	$57,809,426	37,347	$10,657,960	$2,658,306	$36,238,387	$62,382,686
	1890	1,544	35,865,769	20,657	6,598,977	1,904,398	20,862,385	34,814,502
Increase, 1890 to 1900	....	1,791	$21,943,657	16,690	$4,058,983	$753,908	$15,376,002	$27,568,184
Per cent. of increase	....	116.0	61.2	80.8	61.5	39.6	73.7	79.2
Per cent. of total of all industries in State	1900	59.5	82.2	70.6	69.4	78.5	75.3	
	1890	51.9	77.8	66.3	61.1	68.1	73.4	68.9
Cars and general shop construction and repairs by steam railroad companies	1900	19	$2,019,434	4,030	$1,941,031	$86,045	$2,032,166	$4,172,192
	1890	12	909,911	1,373	761,134	.....	784,304	1,581,207
Coke	1900	15	3,855,379	1,592	535,622	180,290	2,673,568	3,726,433
	1890	19	1,368,238	1,120	432,143	7,994	1,810,274	2,474,377
Cotton, ginning[1]	1900	1,216	2,006,406	1,518	194,133	42,560	291,729	1,218,283
	1890	212	289,228	792	57,161	14,263	35,982	213,529
Cotton goods	1900	31	11,638,757	8,332	1,482,226	511,296	4,825,981	8,153,136
	1890	13	2,853,015	2,088	402,908	154,893	1,459,048	2,190,771
Fertilizers	1900	17	1,407,323	439	94,965	92,704	1,387,385	2,068,102
	1890	8	709,250	230	42,835	48,715	519,713	765,000
Flouring and grist mill products	1900	781	1,047,961	540	92,858	34,654	2,787,634	3,310,757
	1890	702	1,410,730	1,043	157,134	56,535	2,471,828	3,060,452
Foundry and machine-shop products	1900	74	4,826,825	3,461	1,329,566	298,553	2,755,921	5,482,441
	1890	41	2,355,253	1,460	736,002	113,262	817,023	2,195,913
Iron and steel	1900	25	15,913,479	7,238	2,454,401	896,126	10,062,094	17,392,483
	1890	35	17,879,583	5,685	2,202,964	1,089,690	7,425,344	12,544,227
Leather, tanned, curried and finished	1900	18	464,005	165	71,440	44,107	672,017	1,005,358
	1890	21	38,045	41	7,997	1,546	42,539	77,066
Lumber and timber products	1900	1,111	13,020,183	9,273	2,265,018	277,521	6,646,124	12,867,551
	1890	472	7,460,108	6,335	1,712,336	330,497	4,551,261	8,507,971
Oil[1], cottonseed and cake	1900	28	1,609,674	759	196,700	194,450	2,103,768	2,985,890
	1890	9	592,408	490	86,363	87,003	945,069	1,203,989

[1]Does not include many ginneries operated in connection with saw, grist and cottonseed-oil mills, or for the use exclusively of plantations on which they are located. For the full number of ginneries in operation reference should be made to the special report on cotton-ginning.

Table 3 shows that the manufacture of iron and steel is the most important industry in the State. The twenty-five establishments reported for this industry in 1900 gave employment to 7238 wage-earners, or 13.7 per cent. of the wage-earners in the State, and the products were valued at $17,392,483, or 21 per cent. of the total value of the products of the State. In 1890 there were thirty-five establishments reported, with 5685 wage-earners, and products valued at $12,544,227. The increase in the value of products during the decade was $4,848,256, or 38.6 per cent.

The importance of the iron and steel industry in Alabama is directly due to the development of extensive deposits of iron ore, coal, limestone and dolomite, which are found in most unusual proximity in the Birmingham district. This combination of natural advantages makes it possible to produce pig-iron at very low cost. A charcoal furnace was built as early as 1818, but it was not until 1874 that the manufacture began to assume importance. Birmingham, named after England's iron center, was founded in 1871, Anniston in 1872, Sheffield in 1883 and Bessemer in 1887. An important epoch in the history of the industry began in 1895, when it was demonstrated that Alabama pig-iron could be laid down in Liverpool, grade for grade, at less than the price of Middlesboro iron shipped across England to that point. Exports to England, continental Europe and Japan in 1896 amounted to 65,000 tons, and in 1900 to 113,185 tons, a quantity greatly in excess of that reported for any other State. The total production of pig-iron in the State in 1890 was valued at $64,590, in 1870 at $210,258, in 1880 at $1,405,356, in 1890 at $10,315,691, and in 1900 at $13,465,616. The most important grade manufactured in the State in 1900 was foundry iron, no other State producing so large a quantity.

Although the manufacture of steel in Alabama is in its infancy, every indication points to a development as rapid as that shown in pig-iron. It seems to be established that the iron ores of Alabama are not suited to the manufacture of steel by the acid or basic Bessemer processes, because of their large percentage of phosphorus and silica, and therefore manufacturers using these ores are practically restricted to the basic open-hearth process. The first attempt to manufacture steel in the State was made in 1888, but until 1897 only indifferent success was attained. In 1900 there were twelve basic open-hearth furnaces in the State, with a daily capacity of 1210 tons of steel ingots. The manufacture was greatly stimulated by the fact that many engineers and architects in 1896 began to show a preference for open-hearth steel, stipulating in their specifications that this variety should be used.

Related to the iron and steel industry is the manufacture of foundry and machine-shop products. There were seventy-four establishments engaged in this industry in 1900, with 3461 wage-earners, and products valued at $5,482,441. In 1890 there were forty-one establishments reported, with 1460 wage-earners, and products valued at $2,195,913. The value of products increased $3,286,528, or 149.7 per cent., during the decade. This industry has been stimulated by the large production of pig-iron, and has, in turn, reacted to increase that production. One of the most important of Alabama's foundry products is cast-iron pipe. There were eleven establishments, most of them at Bessemer, Anniston and Birmingham, engaged in this manufacture during the census year. Some of these export products to foreign countries. Other important iron products of the State are stoves, car wheels, boilers and engines.

The various iron industries have continued to advance since the close of the census year. One of the largest plants in the United States for the manufacture of wire and wire nails has been put into operation at Ensley, a large establishment for the manufacture of steel cars is now being built at the same place, and a tube works and cotton-tie plant has been started at Helena.

The manufacture of coke is also closely connected with the iron manufacture. There were fifteen coke establishments in Alabama in 1900, with 1592 wage-earners, and products valued at $3,726,433, the State ranking third in the United States in this industry. In 1890 there were nineteen establishments, 1120 wage-earners, and products valued at $2,474,377. The value of products increased $1,252,056, or 50.6 per cent., during the decade.

The manufacture of lumber and timber products ranks second. There were 1111 establishments reported for 1900, with 9273 wage-earners, and products valued at $12,867,551. In 1890 there were 472 establishments engaged in this industry, with 6335 wage-earners, and products valued at $8,507,971. The increase in the value of products during the decade was $4,359,580, or 51.2 per cent., and a considerable portion of Alabama's forests is yet untouched by the axe. The lower part of the maritime pine belt is considered equal in extent and quality to the timber lands in the adjoining parts of Florida and Mississippi, and is said to be unsurpassed by the most favored sections of the Atlantic pine forest. A large quantity of timber is floated down streams and sawed in the mills of Florida.

Dependent also upon the forests of the State is the manufacture of turpentine and rosin. There were 152 establishments engaged in this industry in 1900, with 3716 wage-earners, and products valued at $2,033,705. The statistics of the seven establishments reported in 1890 were not shown separately, and comparisons with that year are not possible.

There were thirty-one establishments engaged in the manufacture of cotton goods in 1900, the industry third in rank, with 8332 wage-earners, and products valued at $8,153,136. In 1890, thirteen establishments were reported, with 2088 wage-earners, and products valued at $2,190,771. The increase in value of products during the decade was $5,962,365, or 272.2 per cent., a greater absolute increase than is shown in any other industry in the State.

There were nineteen establishments engaged in the construction and repair-shop work of steam railroad companies in 1900, with 4030 wage-earners, and

products valued at $4,172,192. In 1900 there were twelve establishments, 1375 wage-earners, and products valued at $1,581,207. The increase in the value of products was $2,590,985, or 163.9 per cent. The development of this industry is due to the railroads connecting the Birmingham district with other parts of the country. Six roads center at the city of Birmingham, and several have shops there. Two large establishments, one at Anniston and one at Gadsden, manufacture cars for steam railroads, but the statistics for these cannot be shown separately without disclosing the operations of individual establishments.

There were 781 establishments engaged in flour and grist milling in 1900, with 540 wage-earners, and products valued at $3,310,757. In 1890 there were 702 establishments, 1043 wage-earners, and products valued at $3,060,452. The increase in the value of products during the decade was $250,305, or 8.2 per cent.

There were twenty-eight establishments engaged in the manufacture of cottonseed oil and cake in 1900, with 759 wage-earners, and products valued at $2,985,890. In 1890 there were nine establishments, 490 wage-earners, and products valued at $1,203,989. The increase in the value of products during the decade was $1,781,901, or 148 per cent. Allied to this industry is cotton ginning, with 1216 establishments in 1900, and 1518 wage-earners. The receipts for ginning and other work done amounted to $1,218,283. In 1890 there were 212 establishments reported, with 792 wage-earners, and the receipts for ginning and other work done amounted to $213,529. The increase in these receipts during the decade was $1,004,754, or 470.5 per cent. These figures do not include the operations of many private plantation ginneries, or ginneries connected with saw, grist or cottonseed-oil mills. For the full number of ginneries in operation reference should be made to the special report on cotton ginning. These two industries are directly dependent on the large cotton crop of the State, which in 1899 amounted to 1,103,690 commercial bales, or 11.4 per cent. of the production of the United States.

In 1900, seventeen establishments were reported as engaged in the manufacture of fertilizers, with 439 wage-earners, and products valued at $2,068,162. In 1890 there were eight establishments, 230 wage-earners, and products valued at $765,000. The value of products increased $1,303,162, or 170.3 per cent., during the decade. This growth is due, on the one hand, to the extensive market for fertilizers in the cotton section of the State, and, on the other, to the large production of cottonseed meal. The principal fertilizer manufactured is a combination of this meal with phosphates from the adjacent fields of Florida.

In 1900, eighteen establishments were reported as engaged in the tanning, currying and finishing of leather, with 165 wage-earners, and products valued at $1,005,358. In 1890 there were twenty-one establishments, forty-one wage-earners, and products valued at $77,066. The value of products increased $928,292, or 1204.5 per cent., during the decade.

Mississippi.

The State of Mississippi, after many vicissitudes, is now traveling the road to a high industrial development. An examination of the census figures for 1850, 1860, 1870 and 1880 show that manufacturing was at a very low ebb during those decades. The establishments, which, in 1880, numbered 1479, with a capital of $4,727,600, increased in 1890 to 1698 establishments, with a capital of $14,896,884, and in 1900 to 4772 establishments, with a capital of $35,807,419.

TABLE 1.—COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT. OF INCREASE FOR EACH DECADE.

	Date of Census.						Per Cent. of Increase.				
	1900.	1890.	1880.	1870.	1860.	1850.	1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
Number of establishments	4,772	1,698	1,479	1,731	976	947	181.0	14.8	[1]14.6	77.4	3.1
Capital	$35,807,419	$14,896,884	$4,727,600	$4,501,714	$4,384,492	$1,815,820	140.4	215.1	5.0	2.7	141.5
Salaried officials, clerks, etc., number	1,569	[2]1,352	[3]	[3]	[3]	[3]	16.1	....	....	....	....
Salaries	$1,167,020	[2]$722,109	[3]	[3]	[3]	[3]	61.6	....	....	....	....
Wage-earners, average number	26,418	14,465	5,827	5,941	4,775	3,154	82.6	148.2	[1]1.9	24.4	51.4
Total wages	$7,471,886	$4,191,754	$1,192,645	$1,547,428	$1,618,320	$771,528	78.3	251.5	[1]22.9	[1]4.4	109.8
Men, sixteen years and over	23,643	12,320	4,887	5,500	4,572	3,046	91.9	152.1	[1]11.1	20.3	50.1
Wages	$7,035,534	$3,838,250	[3]	[3]	[3]	[3]	83.3	....	....	....	....
Women, sixteen years and over	1,726	1,236	413	191	203	108	39.6	199.3	116.2	[1]5.9	88.0
Wages	$314,013	$261,526	[3]	[3]	[3]	[3]	20.1	....	....	....	....
Children, under sixteen years	1,049	909	527	250	[3]	[3]	15.4	72.5	110.8	....	....
Wages	$122,339	$91,978	[3]	[3]	[3]	[3]	33.0	....	....	....	....
Miscellaneous expenses	$1,476,855	$827,627	[4]	[4]	[4]	[4]	78.4	....	....	....	....
Cost of materials used	$21,692,092	$10,064,897	$4,667,183	$4,364,206	$3,146,636	$1,275,771	115.5	115.7	6.9	38.7	146.6
Value of products, including custom work and repairing	$40,431,386	$18,705,834	$7,518,302	$8,154,758	$6,590,687	$2,912,068	116.1	148.8	[1]7.8	23.7	126.3
Total population	1,551,270	1,289,600	1,131,597	827,922	791,305	606,526	20.3	14.0	36.7	4.6	30.5
Wage-earners engaged in manufactures	26,418	14,465	5,827	5,941	4,775	3,154	82.6	148.2	[1]1.9	24.4	51.4
Per cent. of total population	1.7	1.1	0.5	0.7	0.6	0.5	....	....	....	....	....
Assessed value of real estate	[5]$158,365,609	$117,004,402	$79,469,530	$118,278,460	$157,836,737	$65,171,438	35.4	47.2	[1]32.8	[1]25.1	142.2
Value of land and buildings invested in manufactures[6]	$13,169,265	$4,453,810	[4]	[4]	[4]	[4]	195.7	....	....	....	....
Per cent. of assessed value	8.3	3.8	.....	.....	.....	.....	....	....	....	....	....

[1]Decrease.
[2]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[3]Not reported separately.
[4]Not reported.
[5]As given in the State Auditor's Comparative Statement of Assessments for 1900.
[6]Does not include the value of rented property.

The population during these years increased from 606,526 to 1,551,270, or 155.8 per cent., while the average number of wage-earners employed in manufacturing establishments increased from 3154 to 26,418, or 737.6 per cent., embracing, in 1900, 1.7 per cent. of the entire population, compared with five-tenths of 1 per cent. in 1850. Probably the best indication of the importance of the wage-earning class is afforded by the greatest number employed at any one time during the year. In 1900 this was 43,369, or 2.8 per cent. of the total population of the State. Measured by the value of products, the greatest percentage of increase, 148.8, was during the decade 1880 to 1890, although the greatest absolute increase was between the years 1890 and 1900.

Mississippi has few of the natural advantages which foster manufactures. It possesses no important harbor, little water-power and few mineral resources. The State is fortunate, however, in having cotton lands of inexhaustible fertility, and extensive forests of pine and hardwood. Its industrial history dates back to the early years of the century. Among the manufacturing establishments reported at the census of 1810 were twenty-two cotton factories, ten tanneries and six distilleries. At the census of 1840 there were reported fifty-three cotton factories, with a total of 318 spindles; 128 tanneries, fourteen distilleries and sixteen flouring mills. With the opening of the Chickasaw Cession to settlement in 1832, a period of gigantic speculation began. No State "plunged more boldly into corrupt banking systems, and none suffered more disastrous consequences." Here, as in other States, this period of excessive speculation terminated in the financial panic of 1837. Repudiation of bonds followed in 1842. Confidence in the general policy and laws of Mississippi was destroyed. The census of 1850 shows only 3154 persons engaged in manufactures, compared with 5060 in 1840. In 1860 the State had, to a large extent, recovered from the speculative influences of these earlier years, and was experiencing its first genuine industrial development. The increase in the value of products during the decade ending with that year was 126.3 per cent. The industrial stagnation throughout the South during the next twenty years is well known, but with 1880 a new period of growth began. Between 1880 and 1890 great efforts were made to attract manufacturers. A bureau of immigration was organized, and in 1882 the legislature passed an act exempting machinery of factories from taxation for ten years.

Table 2 divides the industries of the State between the hand trades and manufactures proper. This table also gives the statistics for eleemosynary institutions, and establishments with a product of less than $500. These were not reported at previous censuses, and therefore are omitted from the other tables and their use confined to Table 2.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	843	$954,599	952	1,518	$560,824	$84,212	$1,272,502	$1,498	$1,219,322	$51,682	$2,622,046
Eleemosynary institutions	4	42,500	...	21	2,199	1,341	3,676	.....	2,587	1,089	13,912
Establishments with a product of less than $500	4,656	1,697,963	4,765	5,767	103,809	38,146	264,093	63,309	200,784	.....	866,076
All other establishments	3,929	34,852,820	4,443	24,900	6,911,062	1,392,643	20,419,590	7,984,546	11,398,732	1,036,312	37,809,340
Total	9,432	$37,547,882	10,160	32,206	$7,577,894	$1,516,342	$21,959,861	$8,049,353	$12,821,425	$1,089,083	$41,311,374

[1]Includes bicycle and tricycle repairing, 12; blacksmithing and wheelwrighting, 362; boots and shoes, custom work and repairing, 55; carpentering, 68; clothing, men's, custom work and repairing, 42; clothing, women's, dressmaking, 21; dyeing and cleaning, 6; furniture, cabinetmaking, repairing and upholstering, 12; lock and gun smithing, 12; masonry, brick and stone, 8; millinery, custom work, 119; painting, house, sign, etc., 28; paperhanging, 1; plastering and stuccowork, 2; plumbing, and gas and steam fitting, 18; sewing-machine repairing, 1; watch, clock and jewelry repairing, 76.

Of the 9432 establishments of all classes shown in this table, 5499, or 58.3 per cent., were small shops included in the groups of "hand trades" and "establishments with a product of less than $500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to $3,488,122, or only 8.4 per cent. of the total value of the products of the State. In addition to the 9432 active establishments in the State during the census year, with a capital of $37,547,882, shown in Table 2, there were sixty-eight idle establishments, with a capital of $68,677, divided as follows:

Industries.	No. of idle establishments.	Capital.
Brick and tile	2	$2,200
Carriage and wagon materials	1	1,706
Cheese, butter and condensed milk, factory product	1	2,525
Cotton, ginning	40	40,217
Flouring and grist mill products	2	3,410

Industries.	No. of idle establishments.	Capital.
Hosiery and knit goods	1	$7,000
Lumber, planing-mill products, including sash, doors and blinds	1	2,500
Pottery, terra-cotta and fire-clay products	1	7,919
All other industries	19	1,200

TABLE 3.—COMPARATIVE SUMMARY OF EIGHT LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	3,205	$29,210,084	20,072	$5,474,122	$1,045,899	$17,621,763	$31,372,442
	1890	963	9,794,213	9,584	2,602,583	508,159	7,325,505	12,638,534
Increase, 1890 to 1900	....	2,242	$19,415,871	10,488	$2,871,539	$537,740	$10,296,258	$18,733,908
Per cent. of increase	....	232.8	198.2	109.4	110.3	105.8	140.6	148.2
Per cent. of total of all industries in State	1900	67.2	81.6	76.0	73.3	70.8	81.2	77.6
	1890	56.7	65.7	66.3	62.1	61.4	72.8	67.6
Cars and general shop construction and repairs by steam railroad companies	1900	9	$741,753	1,534	$807,899	$18,336	$464,034	$1,326,401
	1890	5	612,744	1,076	677,093	.....	632,876	1,329,549
Cotton, ginning[1]	1900	1,901	3,553,853	2,422	281,803	69,882	667,654	2,214,949
	1890	130	211,829	547	43,499	7,961	23,647	130,387
Cotton goods	1900	6	2,209,749	1,675	339,546	117,117	767,327	1,472,835
	1890	9	2,053,743	1,154	263,997	57,622	871,970	1,333,398
Flouring and grist mill products	1900	225	225,335	208	27,244	3,802	805,894	932,816
	1890	408	652,663	777	88,050	25,002	1,009,335	1,249,669
Lumber and timber products	1900	844	17,337,538	9,676	2,790,780	448,710	8,422,253	15,656,110
	1890	366	4,498,788	4,427	1,169,673	216,482	2,867,798	5,770,387
Lumber, planing-mill products, including sash, doors and blinds	1900	34	631,553	748	235,083	32,256	844,248	1,315,775
	1890	8	93,902	92	42,690	4,584	59,170	136,450
Oil, cottonseed and cake	1900	41	3,711,930	1,521	461,357	337,141	4,952,814	6,681,121
	1890	13	1,497,746	891	211,139	186,754	1,757,807	2,406,628
Turpentine and rosin	1900	145	798,373	2,288	530,410	18,655	697,539	1,772,435
	1890	24	173,698	620	106,442	9,754	102,902	282,066

[1]Does not include many ginneries operated in connection with saw, grist and cottonseed-oil mills, or for the use exclusively of plantations on which they are located. For the full number of ginneries in operation reference should be made to the special report on cotton-ginning.

The eight leading industries of the State in 1900, as shown in Table 3, embraced 3205 establishments, or 67.2 per cent. of the total number in the State; used a capital of $29,210,084, or 81.6 per cent. of the total; gave employment to 20,072 wage-earners, or 76 per cent. of the total number, and paid $5,474,122, or 73.3 per cent. of the total wages. The value of their products was $31,372,442, or 77.6 per cent. of the total. In the discussion of Table 3, which follows, these industries are ranked with reference to the value of their products.

Table 3 shows that the manufacture of lumber and timber products is the most important industry in the State. The 844 establishments reported in 1900 gave employment to 9676 wage-earners, or 36.6 per cent. of the wage-earners employed in the State, and the products were valued at $15,656,110, or 38.7 per cent. of the total value of the products of the State. In 1890 there were 366 establishments, 4427 wage-earners, and products valued at $5,770,387. The increase in the value of products during the decade was 171.3 per cent. The forests of Mississippi constitute its most valuable natural resource. The long-leaf pine region of the coastal plain no longer contains much valuable timber, but the rolling pine lands of the interior have been very little exploited. These in 1897 were estimated to cover 7,712,000 acres. The lumber industry is carried on chiefly along the Pascagoula river in the southeast, and in Hancock county in the southwest.

The manufacture of cottonseed oil and cake ranks second, with forty-one establishments, 1521 wage-earners, and products valued at $6,681,121. In 1890 there were thirteen establishments, 891 wage-earners, and products valued at $2,406,628. The increase in the value of products during the decade was 177.6 per cent. In 1900, Meridian had the mill of largest capacity and Greenville the greatest number of establishments. Two establishments, one at Jackson and the other at Meridian, refined as well as expressed the oil. It is claimed that a Mississippian, John Ross, in 1801 made the first written suggestion that oil be expressed from the cottonseed and prophetically named its uses. The first mill in the United States was erected at Natchez, Miss., in 1834, and at the census of 1870, four mills were reported in the State.

Cotton ginning has undergone a remarkable development during the last decade, and now holds third place among the manufacturing industries of the State. There were 1901 establishments reported in 1900, with 2422 wage-earners, and the receipts for ginning and other work done amounted to $2,214,949. In 1890 there were only 130 establishments reported, with 547 wage-earners, and the receipts for ginning and other work done amounted to $130,387. The increase in these receipts during the decade was $2,084,562, or 1598.7 per cent. These figures do not include the operation of many private plantation ginneries, or ginneries connected with saw, grist or cottonseed-oil mills.

There were 145 establishments engaged in the manufacture of turpentine and rosin in 1900, with 2288 wage-earners, and products valued at $1,772,435. In 1890, twenty-four establishments were reported, with 620 wage-earners, and products valued at $282,066. The increase in the value of products during the decade was 528.4 per cent. In 1860 there was but one turpentine still in the State, while in 1880, eleven were reported.

There were six establishments engaged in the manufacture of cotton goods in 1900, with 1675 wage-earners, and products valued at $1,472,835. In 1890, nine establishments were reported, with 1154 wage-earners, and products valued at $1,333,398. The increase in the value of products during the decade was 10.5 per cent. In 1850 there were two mills in the State, with products valued at but $30,500. In 1870 the establishments reported numbered five, and the value of products was $234,445. The eight mills in operation in 1880 reported products valued at $679,093. During the decade, 1870 to 1880, a cotton mill was established, which in 1892 had become what was claimed to be the largest plant of its kind in the South.

There were nine establishments engaged in the construction and general shop work of steam railroad companies in 1900, with 1534 wage-earners, and products valued at $1,326,401. In 1890, five establishments were reported, with 1076 wage-earners, and products valued at $1,329,549. The decrease in the value of products during the decade was two-tenths of 1 per cent. The first railroad shops in the State were those of the West Feliciana Railroad at Woodville. The largest and most complete plant in the State is said to be at McComb City. Five of the establishments reported, both for 1890 and for 1900, are all large, but the four additional shops reported for 1900 are comparatively small, having been erected by short-line railroads or at convenient junction points.

There were thirty-four establishments engaged in the manufacture of planing-mill products in 1900, with 748 wage-earners, and products valued at $1,315,775. In 1890, eight establishments were reported, with ninety-two wage-earners, and products valued at $136,450. The increase in the value of products during the decade was 864.3 per cent.

There were 225 establishments engaged in flour and grist milling in 1900, with 208 wage-earners, and products valued at $932,816. In 1890, 468 establishments were reported, with 777 wage-earners, and products valued at $1,249,669. The decrease in the value of products during the decade was 25.4 per cent.

Louisiana.

The State of Louisiana has made marvelous growth in manufactures during the past ten years; in fact, its growth covers the period from 1880 to 1900. In 1880 the State had 1553 establishments, with a capital of $11,462,468, that had an output of $24,205,183. In 1890 the figures had increased to 2613 establishments, with a capital of $34,754,121 and a product of $57,806,713. According to the reports for 1900, the number of establishments had increased to 4350, representing a capital of $113,084,294, with an output of $121,181,683. A comparative summary showing the figures for the decades from 1850 to 1900, inclusive, is given below:

TABLE 1.—COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT. OF INCREASE FOR EACH DECADE.

	1900.	1890.	Date of Census. 1880.	1870.	1860.	1850.	Per Cent. of Increase. 1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
Number of establishments	4,350	2,613	1,553	2,557	1,744	1,008	66.5	68.3	[1]39.3	46.6	73.0
Capital	$113,084,294	$34,754,121	$11,462,468	$18,313,974	$7,151,172	$5,032,424	225.4	203.2	[1]37.4	156.1	42.1
Salaried officials, clerks, etc., number	3,944	[2]3,524	[3]	[3]	[3]	[3]	11.9	....	....	....	....
Salaries	$3,000,185	[2]$3,036,995	[3]	[3]	[3]	[3]	1.8	....	....	....	....
Wage-earners, average number	42,210	28,377	12,167	30,071	8,789	6,217	48.7	133.2	[1]59.5	242.1	41.4
Total wages	$15,385,715	$10,122,569	$4,360,371	$4,593,470	$3,683,679	$2,033,928	52.0	132.1	[1]5.1	24.7	81.1
Men, sixteen years and over	35,531	20,967	10,171	23,637	7,873	5,458	69.5	106.1	[1]57.0	200.2	44.2
Wages	$14,122,777	$8,868,867	[3]	[3]	[3]	[3]	59.2	....	....	....	....
Women, sixteen years and over	5,448	6,788	1,335	4,210	916	759	[1]19.9	409.2	[1]68.3	359.6	20.7
Wages	$1,112,812	$1,183,229	[3]	[3]	[3]	[3]	[1]6.0	....	....	....	....
Children, under sixteen years	1,231	612	661	2,224	[3]	[3]	101.1	[1]7.4	[1]70.3	....	....
Wages	$150,126	$70,473	[3]	[3]	[3]	[3]	113.0	....	....	....	....
Miscellaneous expenses	$7,999,870	$3,760,753	[4]	[4]	[4]	[4]	112.7	....	....	....	....
Cost of materials used	$82,299,893	$33,282,724	$14,442,506	$12,412,023	$6,738,486	$2,459,508	147.3	130.4	16.4	84.2	174.0
Value of products, including custom work and repairing	$121,181,683	$57,806,713	$24,205,183	$24,161,905	$15,587,473	$6,779,417	109.6	138.8	0.2	55.0	129.9
Total population	1,381,625	1,118,587	939,946	726,915	708,002	517,762	23.5	19.0	29.3	2.7	36.7
Wage-earners engaged in manufactures	42,210	28,377	12,167	30,071	8,789	6,217	48.7	133.2	[1]59.5	242.1	41.4
Per cent. of total population	3.1	2.5	1.3	4.1	1.2	1.2	....	....	....	....	....
Assessed value of real estate	[5]$191,376,383	$159,619,875	$122,362,297	$191,343,376	$280,704,988	$176,623,654	19.9	30.4	[1]36.1	[1]31.8	58.9
Value of land and buildings invested in manufactures[6]	$27,443,599	$9,646,289	[3]	[3]	[3]	[3]	184.5	....	....	....	....
Per cent. of assessed value	14.3	6.0	.....	.....	.....	.....	....	....	....	....	....

[1]Decrease.
[2]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[3]Not reported separately.
[4]Not reported.
[5]As given in the Biennial Report of the Auditor of Public Accounts of the State of Louisiana, May, 1900.
[6]Does not include value of rented property.

The tremendous increase in the number of establishments and capital invested in manufactures in the State of Louisiana is largely accounted for by the increase in the manufacture of sugar. A table will be given hereafter showing the figures for that State for the years 1900, 1890 and 1880. In 1880 there were only four establishments manufacturing sugar in the State of Louisiana, with a capital of $385,000. In 1890 the number had increased to thirty-eight, with a capital of $1,943,601. In 1900 the number had jumped to 384, representing a capital of $52,799,105, showing an increase of $50,000,000, in round numbers, in this industry alone. Other industries that show a marked increase in the capital invested in 1900 over the reports for 1890 are bags, other than paper, cars and general shop construction and repairs by steam railroad companies, foundry and machine-shop products, the lumber and timber products, which industry shows an increase of almost $15,000,000 in capital, oil, cottonseed and cake, and rice.

Tables 2 and 3 will give a summary for all establishments and a comparative summary on the eight leading industries of the State.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	1,057	$2,377,048	1,151	3,000	$1,340,520	$471,222	$2,165,631	$19,027	$2,099,206	$47,398	$5,066,849
Establishments with a product of less than $500.	2,390	1,148,299	2,512	2,702	52,035	40,397	150,201	18,304	131,897	.....	520,962
All other establishments	3,293	110,707,246	3,610	39,210	14,045,195	7,528,648	80,134,252	27,398,084	49,312,104	3,424,074	116,114,834
Total	6,740	$114,232,593	7,273	44,912	$15,437,750	$8,040,267	$82,450,094	$27,435,415	$51,543,207	$3,471,472	$121,702,645

[1]Includes bicycle and tricycle repairing, 23; blacksmithing and wheelwrighting, 361; boots and shoes, custom work and repairing, 131; carpentering, 65; clothing, men's, custom work and repairing, 84; clothing, women's, dressmaking, 29; dyeing and cleaning, 22; furniture, cabinetmaking, repairing and upholstering, 57; lock and gun smithing, 29; masonry, brick and stone, 17; millinery, custom work, 61; painting, house, sign, etc., 36; paperhanging, 4; plastering and stuccowork, 4; plumbing, and gas and steam fitting, 34; sewing-machine repairing, 6; taxidermy, 1; watch, clock and jewelry repairing, 93.

Of the 6740 establishments of all classes shown in this table, 3447, or 51.1 per cent., were small shops included in the groups of "hand trades" and "establishments with a product of less than $500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to $5,587,811, or only 4.6 per cent. of the total value of the products of the State.

In addition to the 6740 active establishments in the State during the census year, with a capital of $114,232,593, shown in Table 2, there were seventy-six idle establishments, with a capital of $499,431, divided as follows:

Industries.	No. of idle establishments.	Capital.
Bread and other bakery products	1	$31,000
Brick and tile	3	7,415
Cotton, ginning	34	36,365
Lumber and timber products	11	69,929
Paving and paving materials	1	16,000
Sugar and molasses, refining	19	341,902
All other industries	7	2,820

TABLE 3.—COMPARATIVE SUMMARY OF EIGHT LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	998	$84,923,908	22,306	$8,550,047	$3,787,575	$66,691,482	$87,181,916
	1890	273	12,737,998	7,904	2,923,031	1,007,609	21,019,089	28,272,588
Increase, 1890 to 1900	....	725	$72,185,910	14,402	$5,617,016	$2,779,966	$45,672,393	$58,909,328
Per cent. of increase	....	265.6	566.7	182.2	191.5	275.9	217.3	208.4
Per cent. of total of all industries in State	1900	22.9	75.1	52.8	55.6	47.3	81.0	71.9
	1890	10.4	36.7	27.9	29.0	26.8	63.2	48.9
Bags, other than paper	1900	5	$819,310	330	$74,334	$16,754	$3,081,840	$3,443,468
	1890	3	201,500	89	32,104	9,755	579,175	669,945
Cars and general shop construction and repairs by steam railroad companies	1900	19	782,588	1,378	800,398	19,699	562,658	1,429,099
	1890	6	156,136	61	43,421	101	61,592	112,847
Foundry and machine-shop products	1900	69	2,949,113	1,313	654,053	97,441	1,283,939	2,672,761
	1890	49	1,658,159	1,095	659,786	59,371	922,559	2,151,586
Lumber and timber products	1900	432	20,093,044	10,171	3,337,020	505,025	9,449,678	17,408,513
	1890	127	5,714,313	3,311	1,160,528	228,247	3,089,179	5,745,194
Lumber, planing-mill products, including sash, doors and blinds	1900	28	1,040,035	881	323,146	45,109	855,165	1,573,481
	1890	27	947,337	643	349,854	51,198	716,967	1,405,576
Oil, cottonseed and cake	1900	24	4,622,569	1,317	347,051	295,358	5,792,469	7,026,452
	1890	7	1,082,752	387	136,182	48,124	1,058,115	1,573,626
Rice, cleaning and polishing	1900	37	1,818,144	412	180,523	162,104	4,954,135	5,736,451
	1890	16	1,033,700	355	133,608	92,429	3,423,650	4,009,901
Sugar and molasses, refining	1900	384	52,799,105	6,504	2,832,222	2,616,085	40,711,598	47,891,691
	1890	38	1,943,601	1,963	417,548	518,384	11,167,852	12,605,913

Arkansas.

The State of Arkansas is usually dismissed with very little consideration when the question of the manufacturing States of the Union is brought into discussion. Table 1, given below, will show, however, that the State is making considerable effort to develop her natural resources:

TABLE 1.—COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT. OF INCREASE FOR EACH DECADE.

	Date of Census. 1900.	1890.	1880.	1870.	1860.	1850.	Per Cent. of Increase. 1890 to 1900.	1880 to 1890.	1870 to 1880.	1860 to 1870.	1850 to 1860.
Number of establishments	4,794	2,073	1,202	1,079	518	261	131.3	72.5	11.4	108.3	98.5
Capital	$35,960,640	$14,971,614	$2,953,130	$1,782,913	$1,316,610	$305,015	140.2	407.0	65.6	35.4	331.7
Salaried officials, clerks, etc., number	1,649	[1]1,829	[2]	[2]	[2]	[2]	[3]9.8	....	....	....	....
Salaries	$1,251,096	[1]$1,100,702	[2]	[2]	[2]	[2]	13.7	....	....	....	....
Wage-earners, average number	26,501	14,143	4,557	3,206	1,877	842	87.4	210.4	42.1	70.8	122.9
Total wages	$8,686,291	$4,649,186	$925,358	$673,963	$554,240	$159,876	86.8	402.4	37.3	21.6	246.7
Men, sixteen years and over	25,158	13,277	4,307	3,077	1,831	812	89.5	208.3	40.0	68.1	125.5
Wages	$8,424,011	$4,515,560	[2]	[2]	[2]	[2]	86.6	....	....	....	....
Women, sixteen years and over	700	463	90	47	46	30	51.2	414.4	91.5	2.2	53.3
Wages	$159,820	$92,383	[2]	[2]	[2]	[2]	73.0	....	....	....	....
Children, under sixteen years	643	403	160	82	[2]	[2]	59.6	151.9	95.1	....	....
Wages	$102,460	$41,243	[2]	[2]	[2]	[2]	148.4	....	....	....	....
Miscellaneous expenses	$1,482,779	$1,035,107	[4]	[4]	[4]	[4]	43.2	....	....	....	....
Cost of materials used	$23,963,768	$12,397,261	$4,392,080	$2,536,998	$1,280,503	$215,789	93.3	182.3	73.1	98.1	493.4
Value of products, including custom work and repairing	$44,883,783	$22,659,179	$6,756,159	$4,629,234	$2,880,578	$537,908	98.1	235.4	45.9	60.7	435.5
Total population	1,311,564	1,128,179	802,525	484,471	435,450	209,897	16.3	40.6	65.6	11.3	107.5
Wage-earners engaged in manufactures	26,501	14,143	4,557	3,206	1,877	842	87.4	210.4	42.1	70.8	122.9
Per cent. of total population	2.0	1.3	0.6	0.7	0.4	0.4	....	....	....	....	....
Assessed value of real estate	[5]$128,084,667	$109,417,158	$55,760,388	$83,102,304	$63,254,740	$17,372,524	17.1	96.2	[3]11.6	[3]0.2	264.1
Value of land and buildings invested in manufactures[6]	$11,845,887	$4,490,567	[2]	[2]	[2]	[2]	163.8	....	....	....	....
Per cent. of assessed value	9.2	4.1	.....	.....	.....	.....	....	....	....	....	....

[1]Includes proprietors and firm members, with their salaries; number only reported in 1900.
[2]Not reported separately.
[3]Decrease.
[4]Not reported.
[5]As given in letter of T. C. Monroe, State Auditor of Arkansas, August 19, 1901.
[6]Does not include value of rented property.

It will be noted that the capital invested in manufacturing has increased from $305,015 in 1850 to $35,960,640 in 1900, an increase of practically $21,000,000 since 1890, or 140 per cent. Table 2 shows a summary for all establishments, including hand trades:

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

Classes.	Number of establishments.	Capital.	Proprietors and firm members.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of Materials Used. Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	Value of products, including custom work and repairing.
Hand trades[1]	1,061	$1,013,308	1,255	1,302	$545,675	$157,559	$1,014,272	$41,215	$918,125	$54,932	$2,675,443
Eleemosynary institution	1	1,875	....	....	.....	.....	162	80	82	.....	330
Establishments with a product of less than $500.	3,589	1,207,284	4,006	2,672	57,980	30,913	201,237	19,918	181,319	.....	689,465
All other establishments	3,733	34,947,332	4,496	25,199	8,140,616	1,325,220	22,949,496	6,669,950	15,483,959	795,587	42,208,340
Total	8,384	$37,169,799	9,757	29,173	$8,744,271	$1,513,692	$24,165,167	$6,731,163	$16,583,485	$850,519	$45,573,578

[1]Includes bicycle and tricycle repairing, 12; blacksmithing and wheelwrighting, 533; boots and shoes, custom work and repairing, 80; carpentering, 59; clothing, men's, custom work and repairing, 64; clothing, women's, dressmaking, 16; dyeing and cleaning, 11; furniture, cabinetmaking, repairing and upholstering, 25; lock and gun smithing, 15; masonry, brick and stone, 3; millinery, custom work, 116; painting, house, sign, etc., 21; paperhanging, 1; plastering and stuccowork, 1; plumbing, and gas and steam fitting, 22; sewing-machine repairing, 6; watch, clock and jewelry repairing, 76.

The following statement shows the number of industries that were idle during the census year, and a summary of the leading industries of the State.

In addition to the 8384 active establishments in the State during the census year, with a capital of $37,169,799, shown in Table 2, there were 106 idle establishments, with a capital of $601,048, divided as follows:

Industries.	No. of idle establishments.	Capital.
Brick and tile	10	$20,065
Cotton, ginning	38	34,176
Furniture, cabinet-making, repairing and upholstering	1	7,013
Liquors, distilled	4	13,460
Lumber and timber products	31	508,033
Lumber, planing-mill products, including sash, doors and blinds	1	$3,200
Marble and stone work	1	5,820
Woolen goods	2	5,140
All other	18	4,141

Table 3, which gives a summary of the seven leading industries of the State, indicates that the manufacture of lumber and timber products is by far the most important in Arkansas. In lumber and timber products the capital invested increased from $6,928,720 in 1890 to $21,727,710 in 1900. The business of cotton-ginning also shows a tremendous growth.

TABLE 3.—COMPARATIVE SUMMARY OF SEVEN LEADING INDUSTRIES.

Industries.	Year.	No. of establishments.	Capital.	Wage-earners. Average number.	Wage-earners. Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
Total for selected industries for State	1900	3,067	$29,817,055	21,717	$6,990,732	$939,133	$20,832,017	$37,006,409
	1890	1,250	11,320,834	10,384	3,291,392	686,892	10,305,545	17,275,192
Increase, 1890 to 1900	....	1,817	$18,496,221	11,333	$3,699,340	$252,241	$10,526,472	$19,731,217
Per cent. of increase	....	145.4	163.4	109.1	112.4	36.7	102.1	114.2
Per cent. of total of all industries in State	1900	64.0	82.9	81.9	80.5	63.3	86.9	82.4
	1890	60.3	75.6	73.4	70.8	66.4	83.1	76.2
Cars and general shop construction and repairs by steam railroad companies	1900	21	$720,907	1,927	$1,203,761	$27,124	$765,003	$2,095,447
	1890	8	355,747	847	563,187	....	715,340	1,299,558
Cotton, ginning[1]	1900	1,150	1,838,698	1,103	146,041	43,740	342,125	1,261,097
	1890	137	221,620	569	50,638	12,677	30,725	153,226
Flouring and grist mill products	1900	410	1,183,052	443	116,445	44,681	3,029,236	3,708,709
	1890	376	975,616	742	107,439	55,898	2,041,587	2,498,168
Lumber and timber products	1900	1,199	21,727,710	15,895	4,739,413	522,653	13,068,267	23,959,983
	1890	539	6,928,720	6,563	1,894,395	292,541	4,798,577	8,943,052
Lumber, planing-mill products, including sash, doors and blinds	1900	50	1,213,011	1,082	345,806	60,778	1,459,636	2,266,522
	1890	38	850,092	640	279,692	45,209	1,219,151	1,761,932
Oil, cottonseed and cake	1900	20	2,484,794	667	232,856	160,896	1,995,771	2,874,864
	1890	8	1,488,630	511	158,651	160,148	1,319,039	1,881,668
Printing and publishing, newspapers and periodicals	1900	217	648,883	609	215,410	79,261	171,979	839,787
	1890	144	500,349	512	237,429	122,419	181,126	737,588

[1]Does not include many ginneries operated in connection with saw, grist and cottonseed-oil mills, or for the use exclusively of plantations on which they are located. For the full number of ginneries in operation reference should be made to the special report on cotton-ginning.

Texas.

The final bulletin for the State of Texas has not yet been issued by the census bureau. The table given below shows the preliminary figures which are contained in the preliminary statement given out January 6:

	1900.	1890.	Per cent. of increase.
Number of establishments	12,289	5,268	133.3
Capital	$90,433,882	$46,815,181	93.2
Wage-earners, average number	48,152	34,794	38.4
Total wages	$20,552,355	$15,148,495	35.7
Miscellaneous expenses	6,144,924	3,594,940	70.9
Cost of materials used	67,102,769	36,152,308	85.6
Value of products, including custom work and repairing	119,414,982	70,433,551	69.5

DALLAS.	1900.	1890.	Per cent. of increase.
Number of establishments	373	312	19.6
Capital	$6,897,015	$5,250,118	31.4
Wage-earners, average number	3,756	3,554	5.7
Total wages	$1,852,485	$2,015,369	[2]8.1
Miscellaneous expenses	665,954	595,257	11.9
Cost of materials used	6,270,870	4,354,769	44.0
Value of products, including custom work and repairing	11,480,499	9,054,766	26.8

[2]Decrease.

AUSTIN.	1900.	[1]1890.
Number of establishments	279	
Capital	$825,280	
Wage-earners, average number	967	
Total wages	$471,818	
Miscellaneous expenses	152,199	
Cost of materials used	896,750	
Value of products, including custom work and repairing	1,921,853	

[1]Not reported separately in 1890.

WACO.	1900.	[1]1890.
Number of establishments	166	
Capital	$2,096,741	
Wage-earners, average number	1,227	
Total wages	$469,129	
Miscellaneous expenses	222,681	
Cost of materials used	1,477,642	
Value of products, including custom work and repairing	2,693,907	

[1]Not reported separately in 1890.

GALVESTON.	1900.	1890.	Per cent. of increase.
Number of establishments	295	190	55.3
Capital	$6,073,845	$5,122,612	18.6
Wage-earners, average number	2,058	1,679	22.6
Total wages	$981,827	$962,093	2.1
Miscellaneous expenses	477,229	405,270	17.8
Cost of materials used	2,618,986	3,253,088	[2]19.5
Value of products, including custom work and repairing	5,016,380	5,724,545	[2]12.4

[2]Decrease.

FORT WORTH.	1900	1890.	Per cent. of increase.
Number of establishments	208	316	[2]34.2
Capital	$2,108,045	$3,194,032	[2]34.0
Wage-earners, average number	1,338	2,368	[2]43.5
Total wages	$780,477	$1,618,073	[2]51.8
Miscellaneous expenses	182,785	286,452	[2]36.2
Cost of materials used	3,210,722	3,435,446	[2]6.5
Value of products, including custom work and repairing	4,876,792	6,826,083	[2]28.6

[2]Decrease.

HOUSTON.	1900.	1890.	Per cent. of increase
Number of establishments	507	210	141.4
Capital	$6,925,865	$3,509,434	97.3
Wage-earners, average number	4,590	2,711	68.9
Total wages	$2,405,770	$1,353,628	77.7
Miscellaneous expenses	662,012	313,114	111.4
Cost of materials used	5,735,703	3,638,205	57.7
Value of products, including custom work and repairing	10,588,175	6,832,943	54.7

SAN ANTONIO.	1900.	1890.	Per cent. of increase.
Number of establishments	312	309	1.0
Capital	$4,252,197	$3,004,425	41.5
Wage-earners, average number	3,073	2,022	52.0
Total wages	$1,755,008	$1,216,936	44.2
Miscellaneous expenses	654,339	494,744	32.3
Cost of materials used	3,284,524	2,387,984	37.5
Value of products, including custom work and repairing	6,821,797	5,623,612	21.3

The city of Fort Worth shows considerable decrease in all the items. It is presumed that the devastation of Galveston by the tidal wave last year wrecked most of the establishments reported in this statement.

The figures are interesting, inasmuch as they show what the enterprising citizens of Galveston accomplished in ten years, from 1890 to 1900.

Tabulated statements are here given showing the manufactures of turpentine and rosin in seven of the Southern States, the manufacture of sugar in Louisiana, the production of coke in six of the Southern States, the production of cotton and its value at eight and ten cents per pound, lumber and timber products of the Southern States, iron and steel industry, foundry and machine products, and the manufacture of gas.

The figures given, it is hoped, will throw some light on the growth of the various important lines of industry in the States which have been under discussion.

In order to give an adequate idea of the wonderful advance in the industrial situation in the Southern States during the last two decades, it has been necessary to present a great mass of statistics, much of which will doubtless be uninteresting. The data serves to show, however, the great industrial change that is going on all over the South, and indicates the possibilities for her future advance in the line of material acquisition. The South has excellent railroad facilities, splendid harbors, broad rivers and energetic men, and there is no reason, with these opportunities, why these great States should not occupy foremost places among the industrial Commonwealths of the Union. Already she has upwards of one-tenth of the entire manufacturing output of the United States, and with any reasonable per cent. of increase during the next decade she will much better her position in this regard.

Some recent investigations into the increase of the population during the twenty-year periods of the nineteenth century indicate that the growth of population in the North during the last two decades was 48.7 per cent., and in the South 48.5. In the West the growth is much larger, because that country has but recently been opened to settlement. The figures indicate that the South is keeping pace with the North in growth of population.

A few years ago there passed from sight one of the bright young men of Georgia—a devoted patriot, eloquent, a lover of his country, and especially of his own section. This man—I refer to Henry W. Grady—uttered the words that I give below, and which I think especially appropriate as a peroration to this somewhat lengthened presentation of the industries of the South:

"As I think of it, a vision of surpassing beauty unfolds to my eyes. I see a South, the home of fifty millions of people, who rise up every day to call from blessed cities vast hives of industry and thrift; her country-sides the treasures from which their resources are drawn; her streams vocal with whirring spindles; her valleys tranquil in the white and gold of the harvest; her mountains showering down the music of bells, as her slow-moving flocks and herds go forth from their folds; her rulers honest and her people loving, and her homes happy and their hearthstones bright, and their waters still, and their pastures green, and her conscience clear; her wealth diffused and poorhouses empty; her churches earnest, and all creeds lost in the Gospel; peace and sobriety walking hand in hand through her borders; honor in her homes, uprightness in her midst, plenty in her fields, straight and simple faith in the hearts of her sons and daughters; her two races walking together in peace and contentment; sunshine everywhere and all the time, and night falling on her generally as from the wings of an unseen dove.

"All this, my country, and more, can we do for you. As I look the vision grows, the splendor deepens, the horizon falls back, the skies open their everlasting gates, and the glory of the Almighty God streams through as He looks down on His people who have given themselves unto Him, and leads them from one triumph to another until they have reached a glory unspeaking, and the whirling stars, as in their courses through Arcturus they run to the Milky Way, shall not look down upon a better people or happier land."

MANUFACTURES OF THE SOUTH.

GAS

States.	Quantity, Cubic Feet. 1900.	1890.	Value. 1900.	1890.	Average value per 1000 cubic ft. 1900.	1890.	Increase in quantity (cubic ft.). 1890-1900.	Increase in value. 1890-1900.	Per cent. of increase in quantity. 1890-1900.	Per cent. of increase in value. 1890-1900.
Maryland	1,414,721,120	1,401,959,800	$1,770,889	$1,770,062	$1.252	$1.263	12,761,320	$807	.9	.1
Virginia	406,212,660	103,130,200	438,671	173,311	1.080	1.681	303,082,460	265,360	293.9	153.1
West Virginia	146,980,430	141,419,900	126,598	124,750	.861	.882	5,560,530	1,848	3.9	1.5
North Carolina	46,451,300	40,267,125	110,956	82,376	2.389	2.046	6,184,175	28,580	15.4	34.7
South Carolina	99,383,400	(1)	152,755	—	1.537	(1)	(1)	(1)	(1)	(1)
Georgia	451,946,212	322,529,767	558,182	445,903	1.235	1.383	129,416,445	112,279	40.1	25.2
Florida	78,022,877	46,545,000	154,290	114,441	1.977	2.459	31,477,877	39,849	67.6	34.8
Kentucky	447,352,340	117,452,400	574,627	204,531	1.285	1.741	329,899,940	370,096	280.9	180.9
Tennessee	344,411,892	285,299,900	476,214	462,728	1.383	1.622	59,111,992	13,486	20.7	2.9
Alabama	122,635,152	101,401,500	198,865	178,036	1.622	1.756	21,233,652	20,829	20.9	11.7
Mississippi	36,716,805	(1)	74,041	(1)	2.017	(1)	(1)	(1)	(1)	(1)
Louisiana	204,503,400	207,998,900	428,605	665,631	2.096	3.200	[2]3,495,500	[2]237,026	71.7	[2]35.6
Arkansas	66,543,948	57,608,600	129,135	144,221	1.941	2.503	8,935,348	[2]15,086	15.5	[2]10.5
Texas	172,088,580	147,193,176	317,581	346,197	1.845	2.352	24,895,404	[2]28,616	16.9	[2]8.3
Totals	4,037,970,116	2,972,806,268	$5,511,389	$4,712,187	$1.365	$1.585	1,065,163,848	$799,202	35.8	17.0

[1]Not separately shown in 1890.

SUMMARY.

	1900.	1890.	Increase. 1890-1900.	Per cent. of increase. 1890-1900.
Quantity, cubic feet	4,037,970,116	2,972,806,268	1,065,163,848	35.8
Value	$5,511,389	$4,712,187	$799,202	17.0
Average value per 1000 cubic feet	1.365	1.585	[2].220	....

[2]Decrease.

Turpentine and Rosin.

Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina and South Carolina.

	1900.	1890.	1880.	Increase. 1890 to 1900.	Increase. 1880 to 1890.	Percentage of Increase. 1890 to 1900.	Percentage of Increase. 1880 to 1890.
No. of establishments..	1,503	670	508	833	162	124.3	31.9
Capital	$11,847,495	$4,062,375	$1,866,390	$7,785,120	$2,195,985	191.6	117.7
Wage-earners, average number	41,864	15,266	10,535	26,598	4,731	174.2	44.9
Total wages	$8,393,483	$2,906,547	$1,623,061	$5,486,936	$1,283,486	188.8	79.1
Miscellaneous expenses.	476,171	178,662	(1)	297,509	(1)	166.5	(1)
Cost of materials used.	6,186,492	2,874,693	2,324,637	3,311,799	550,056	115.2	23.7
Value of products	20,344,888	8,077,379	5,876,983	12,267,509	2,200,396	151.9	37.4

[1]Not reported for 1880.

Manufacture of Sugar for Louisiana.

	1900.	1890.	1880.	Increase. 1890 to 1900.	Increase. 1880 to 1890.	Percentage of Increase. 1890 to 1900.	Percentage of Increase. 1880 to 1890.
No. of establishments..	384	38	4	346	34	910.5	850.0
Capital	$52,799,105	$1,943,601	$385,000	$50,855,504	$1,558,601	2,616.6	404.8
Wage-earners, average number	6,504	1,963	190	4,541	1,773	231.3	933.2
Total wages	$2,833,222	$417,548	$50,000	$2,415,674	$367,548	578.5	735.1
Miscellaneous expenses.	2,616,085	518,384	(1)	2,097,701	(1)	404.7	(1)
Cost of materials used.	40,711,598	11,167,852	1,340,000	29,543,746	9,827,852	264.5	733.4
Value of products	47,891,691	12,603,913	1,483,000	35,287,778	11,120,913	280.0	749.9

[1]Not reported for 1880.

NOTE.—The manufacture of sugar in other Southern States is too small to be considered in detail.

Coke, 1880, 1890 and 1900.

States.	Tons of Coke Produced. 1900.	1890.	1880.	Percentage of Increase. 1890 to 1900.	Percentage of Increase. 1880 to 1890.	Percentage of Total Output. 1900.	1890.	1880.	Valuation. 1900.
West Virginia.	2,278,679	612,645	95,720	271.9	540.0	11.6	6.1	3.5	$3,470,405
Alabama	1,787,809	1,055,823	42,035	69.3	2,411.8	9.1	10.5	1.5	3,634,471
Virginia	618,707	(1)	....	....	....	3.2	....	...	1,071,284
Tennessee	380,525	356,964	91,675	6.6	289.4	1.9	3.6	3.3	764,890
Kentucky	81,096	13,021	....	522.8	....	0.4	0.1	...	161,454
Georgia	50,907	(1)	70,000	....	....	0.3	....	2.5	[2]75,352
Total	5,197,722	.....	....	....	....	....	....	...	$9,177,856

[1]Not separately shown. [2]Estimated.

These six States produced in 1900 26.5 per cent. of the total amount of coke produced.

Cotton.

State.	Bales of 500 Pounds. 1900.	1890.	1880.	Increase in Bales of 500 Pounds. 1890 to 1900.	1880 to 1890.	Per Cent. of Increase. 1890 to 1900.	1880 to 1890.
Alabama	1,078,519	873,110	633,887	205,409	239,223	23.5	37.7
Arkansas	705,583	659,685	551,080	45,898	108,605	7.0	19.7
Florida	49,359	55,263	49,827	[1]5,904	5,436	[1]10.7	10.9
Georgia	1,231,060	1,137,021	737,884	94,039	399,137	8.3	54.1
Kentucky	79	833	1,238	[1]754	[1]405	[1]90.5	[1]32.7
Louisiana	700,352	628,858	460,763	71,494	168,095	11.4	36.5
Mississippi	1,237,666	1,101,608	872,579	136,058	229,029	12.4	26.2
North Carolina	440,400	320,793	352,976	119,607	[1]32,183	37.3	[1]9.1
South Carolina	837,105	712,819	473,428	124,286	239,391	17.4	50.6
Tennessee	211,641	181,812	299,543	29,829	[1]117,731	16.4	[1]39.3
Texas	2,609,018	1,403,565	729,587	1,205,453	673,978	85.9	92.4
Virginia	8,622	5,128	17,753	3,494	[1]12,625	68.1	[1]71.1
Totals	9,109,404	7,080,495	5,180,545	2,028,909	1,899,950	28.7	36.7

[1]Decrease.

State.	Value at 8 Cents per Pound. 1900.	1890.	1880.	Value at 10 Cents. per Pound. 1900.	1890.	1880.
Alabama	$43,140,760	$34,924,400	$25,355,480	$53,925,950	$43,655,500	$31,694,350
Arkansas	28,223,320	26,387,400	22,043,200	35,279,150	32,984,250	27,554,000
Florida	1,974,360	2,210,520	1,993,080	2,467,950	2,763,150	2,491,350
Georgia	49,242,400	45,480,840	29,515,360	61,553,000	56,851,050	36,894,200
Kentucky	3,160	33,320	49,520	3,950	41,650	61,900
Louisiana	28,014,080	25,154,320	18,430,520	35,017,600	31,442,900	23,038,150
Mississippi	49,506,640	44,064,320	34,903,160	61,883,300	55,080,400	43,628,950
North Carolina	17,616,000	12,831,720	14,119,040	22,020,000	16,039,650	17,648,800
South Carolina	33,484,200	28,512,760	18,937,120	41,855,250	35,640,950	23,671,400
Tennessee	8,465,640	7,272,480	11,981,720	10,582,050	9,090,600	14,977,150
Texas	104,360,720	56,142,600	29,183,480	130,450,900	70,178,250	36,479,350
Virginia	344,880	205,120	710,120	431,100	256,400	887,650
Totals	$364,376,160	$283,219,800	$207,221,800	$455,470,200	$354,024,750	$259,027,250

Summary.

	1900.	1890.	1880.	Increase. 1890 to 1900.	Increase. 1880 to 1890.	Per Cent. of Increase. 1890 to 1900.	Per Cent. of Increase. 1880 to 1890.
Bales of 500 lbs	9,109,404	7,080,495	5,180,545	2,028,909	1,899,950	28.7	36.7
Value at 8 cts. per lb.	$364,376,160	$283,219,800	$207,221,800	$81,156,360	$75,998,000	28.7	36.7
Value at 10 cts. per lb.	455,470,200	354,024,750	259,027,250	101,445,450	94,997,500	28.7	36.7

Lumber and Timber Products, 1900, 1890 and 1880.

1900.

State.	No. of establishments.	Capital.	Wage-earners, average No.	Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products.
Maryland	367	$2,622,928	1,964	$476,776	$63,004	$1,390,357	$2,650,082
Virginia	1,341	9,299,046	7,611	2,144,382	327,615	6,763,831	12,137,177
West Virginia	950	10,421,570	5,327	1,828,558	314,111	5,584,717	10,612,837
North Carolina	1,770	13,385,097	11,751	2,491,089	321,048	7,743,235	14,862,593
South Carolina	729	5,187,727	4,585	897,899	107,445	2,629,805	5,207,184
Georgia	1,254	11,802,716	10,240	2,344,523	249,636	6,665,897	13,704,923
Florida	416	14,937,693	7,081	2,197,875	486,706	5,725,887	10,848,403
Kentucky	1,280	9,805,404	7,549	2,477,696	379,074	7,379,148	13,774,911
Tennessee	1,732	12,900,595	11,192	3,424,510	402,409	10,008,275	18,127,784
Alabama	1,111	13,020,183	9,273	2,265,018	277,521	6,646,124	12,867,551
Mississippi	844	17,337,538	9,676	2,790,780	448,710	8,422,253	15,656,110
Louisiana	432	20,093,044	10,171	3,337,020	505,025	9,449,678	17,408,513
Arkansas	1,199	21,727,710	15,895	4,730,413	522,653	13,068,267	23,959,983
Texas	637	19,161,265	7,924	3,094,917	368,437	9,668,343	16,296,473
Totals	14,062	$181,702,516	120,239	$34,501,456	$4,773,394	$101,145,817	$188,114,524

1890.

Maryland	217	$1,459,895	1,552	$335,909	$54,928	$840,941	$1,600,472
Virginia	663	4,427,627	5,969	1,244,633	237,389	2,926,474	5,630,600
West Virginia	454	5,086,114	4,182	1,039,530	203,511	3,023,297	5,515,065
North Carolina	713	5,376,807	6,466	1,202,994	232,088	3,038,960	5,898,742
South Carolina	352	1,848,155	2,590	420,588	93,717	996,289	2,146,750
Georgia	449	5,019,635	5,943	1,533,217	228,279	3,304,249	6,545,195
Florida	215	5,438,366	4,363	1,289,276	274,213	2,745,016	5,514,879
Kentucky	599	6,571,374	6,322	1,568,394	381,797	4,375,392	7,904,428
Tennessee	820	7,259,027	7,424	1,860,008	354,376	5,045,906	9,073,686
Alabama	472	7,460,108	6,335	1,712,336	330,497	4,551,261	8,507,971
Mississippi	366	4,498,788	4,427	1,169,673	216,482	2,867,798	5,770,387
Louisiana	127	5,714,313	3,311	1,160,528	228,247	3,089,179	5,745,194
Arkansas	539	6,928,720	6,563	1,894,395	292,541	4,798,577	8,943,052
Texas	314	11,175,551	7,485	2,656,119	490,984	6,420,878	11,942,566
Totals	6,300	$78,264,480	72,932	$19,082,600	$3,619,049	$48,024,217	$90,738,987

1880.

Maryland	369	$1,237,694	1,239	$223,786		$1,106,796	$1,813,332
Virginia	907	2,122,925	4,011	540,231		1,983,777	3,434,163
West Virginia	472	1,668,920	2,183	459,945		1,375,372	2,431,857
North Carolina	776	1,743,217	3,029	447,431		1,577,139	2,672,796
South Carolina	420	1,056,265	1,468	221,963		1,237,361	2,031,507
Georgia	655	3,101,452	3,392	554,085		3,197,155	4,875,310
Florida	135	2,219,550	2,030	562,249		1,867,213	3,060,291
Kentucky	670	2,290,558	2,601	671,939		2,410,743	4,064,361
Tennessee	755	2,004,503	3,718	549,222	Not reported.	2,142,885	3,744,905
Alabama	354	1,545,655	1,647	424,156		1,608,635	2,649,634
Mississippi	295	922,595	1,170	197,867		1,219,116	1,920,335
Louisiana	175	903,950	976	200,063		1,187,059	1,764,640
Arkansas	319	1,067,840	1,744	237,394		1,070,395	1,793,848
Texas	324	1,660,952	3,186	732,914		2,096,775	3,673,449
Totals	6,626	$23,546,076	32,394	$6,023,245		$24,080,420	$39,930,428

Summary.

	1900.	1890.	1880.	Increase. 1890 to 1900.	Increase. 1880 to 1890.	Per Cent. of Increase. 1890 to 1900.	Per Cent. of Increase. 1880 to 1890.
No. of establishments	14,062	6,300	6,626	7,762	[1]326	123.2	[1]4.9
Capital	$181,702,516	$78,264,480	$23,546,076	$103,438,036	$54,718,464	132.1	232.4
Wage-earners, average number	120,239	72,932	32,394	47,307	40,538	64.9	125.1
Total wages	$34,501,456	$19,082,600	$6,023,245	$154,118,856	$13,059,355	80.8	216.8
Miscellaneous expenses.	4,773,394	3,619,049	(2)	1,154,345	(2)	31.9	(2)
Cost of materials	101,145,817	48,024,217	24,080,420	53,121,600	23,943,797	110.6	99.4
Value of products	188,114,524	90,738,987	39,930,428	97,375,537	50,808,559	107.3	127.2

[1]Decrease. [2]Not reported for 1880.

Lumber, Planing-Mill Products, Including Sash, Doors and Blinds.

1900.

State.	No. of establishments.	Capital.	Wage-earners, average No.	Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products.
Maryland	53	$3,534,501	1,323	$542,262	$158,244	$2,452,655	$3,753,083
Virginia	88	1,618,158	1,333	467,962	163,314	1,625,501	2,686,898
West Virginia	83	803,673	555	238,595	41,171	1,199,914	1,820,463
North Carolina	101	1,366,823	1,939	473,589	78,377	1,801,478	2,892,058
South Carolina	53	412,128	495	146,539	20,042	621,831	1,016,328
Georgia	99	2,074,226	2,171	672,243	102,159	2,280,495	4,302,976
Florida	20	415,349	481	186,675	29,048	405,492	777,782
Kentucky	90	1,508,038	981	379,273	101,882	1,088,331	1,891,517
Tennessee	85	1,296,081	1,148	447,959	84,180	1,294,700	2,273,457
Alabama	50	345,872	432	140,659	15,680	452,649	763,125
Mississippi	34	631,553	748	235,083	32,256	844,248	1,315,775
Louisiana	28	1,040,035	881	323,446	45,109	855,165	1,573,481
Arkansas	50	1,213,011	1,082	345,896	60,778	1,459,636	2,266,522
Texas	76	932,860	657	332,288	40,632	900,302	1,605,297
Totals	910	$17,192,308	14,226	$4,932,379	$972,872	$17,283,397	$28,938,762

1890.

Maryland	45	$1,990,138	1,174	$661,361	$131,296	$2,005,755	$3,332,563
Virginia	65	1,586,966	1,136	444,743	82,994	1,252,291	2,350,281
West Virginia	50	493,113	444	181,196	25,623	543,793	910,640
North Carolina	42	488,770	584	195,070	26,284	515,213	915,070
South Carolina	27	350,471	370	132,017	16,606	396,242	711,838
Georgia	82	1,677,880	2,157	851,290	126,193	1,907,370	3,548,972
Florida	16	160,155	148	74,801	7,689	119,799	270,205
Kentucky	60	1,849,386	1,389	646,487	88,000	1,873,328	3,073,692
Tennessee	73	2,283,737	1,498	759,088	104,017	1,926,674	3,450,243
Alabama	47	798,195	639	283,167	27,861	645,583	1,228,287
Mississippi	8	93,002	92	42,630	4,584	59,170	136,450
Louisiana	27	947,837	643	349,854	51,198	716,967	1,405,576
Arkansas	38	850,092	640	279,662	45,209	1,219,151	1,761,932
Texas	62	1,169,445	949	541,032	81,848	1,554,926	2,700,941
Totals	642	$14,739,187	11,863	$5,442,458	$819,402	$14,736,262	$25,796,690

1880.

Maryland	24	$522,625	533	$242,660		$470,388	$917,580
Virginia	24	197,200	305	105,329		439,617	684,835
West Virginia	18	327,850	189	79,122		261,400	408,050
North Carolina	16	96,600	221	62,168		75,424	200,320
South Carolina	13	111,500	260	54,642		143,740	242,250
Georgia	27	282,500	682	164,663		353,300	737,200
Florida	2	32,000	35	10,460		38,000	57,000
Kentucky	25	592,618	513	211,487	Not reported.	661,397	1,117,233
Tennessee	23	301,200	390	143,375		283,500	539,335
Alabama	13	114,500	117	35,790		94,909	161,900
Mississippi	8	29,700	68	20,025		64,300	101,200
Louisiana	15	374,500	281	132,173		417,960	721,480
Arkansas	3	3,175	19	5,300		20,885	33,100
Texas	25	249,400	273	123,575		600,840	873,100
Totals	236	$3,235,368	3,796	$1,381,769		$3,925,660	$6,794,583

Summary.

	1900.	1890.	1880.	Increase. 1890 to 1900.	Increase. 1880 to 1890.	Per Cent. of Increase. 1890 to 1900.	Per Cent. of Increase. 1880 to 1890.
No. of establishments	910	642	236	268	406	41.7	172.0
Capital	$17,192,308	$14,739,187	$3,235,368	$2,453,121	$11,503,819	16.6	355.6
Wage-earners, average number	14,226	11,863	3,796	2,363	8,067	19.9	212.5
Total wages	$4,932,379	$5,442,458	$1,381,769	[1]$510,079	$4,060,689	[1]9.4	293.9
Miscellaneous expenses.	972,872	819,402	(2)	153,470	(2)	18.7	(2)
Cost of materials used	17,283,397	14,736,262	3,925,660	2,547,135	10,810,602	17.3	275.4
Value of products	28,938,762	25,796,690	6,794,583	3,142,072	19,002,107	12.2	279.7

[1]Decrease. [2]Not reported for 1880.

Iron and Steel Industries for 1900, 1890 and 1880.

1900.

State.	No. of establishments.	Capital.	Wage-earners, average No.	Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products.
Maryland	9	$2,892,690	2,138	$1,029,753	$508,298	$6,888,916	$8,739,405
Virginia	20	6,686,696	3,097	980,587	248,314	5,498,672	8,341,888
West Virginia	11	8,202,910	4,467	2,293,524	225,165	10,422,322	16,514,212
North Carolina	2	410,169	127	27,411	1,441	148,848	161,139
Georgia	3	655,916	194	48,391	8,300	237,421	391,599
Kentucky	8	4,198,987	2,402	1,144,782	176,846	4,324,100	6,876,093
Tennessee	16	5,381,165	1,979	539,304	226,365	3,404,154	5,080,624
Alabama	25	15,913,479	7,238	2,454,401	896,126	10,062,094	17,392,483
Texas	2	159,215	131	26,599	8,229	57,670	105,823
Totals	96	$44,501,227	21,773	$8,544,752	$2,299,084	$41,044,197	$63,603,266

1890.

Maryland	10	$4,067,574	1,247	$371,993	$46,077	$2,217,173	$2,869,208
Virginia	17	3,662,588	1,418	548,626	275,580	2,943,671	4,247,868
West Virginia	7	4,215,097	2,013	1,098,489	102,624	5,606,883	7,490,934
North Carolina[1]	..	.....	.....	.....	.....	.....	.....
Georgia	5	908,243	339	89,045	58,632	321,728	471,757
Kentucky	9	2,310,655	1,435	670,489	115,645	1,703,144	2,725,603
Tennessee	15	4,613,355	1,472	657,975	276,969	2,943,671	4,247,868
Alabama	35	17,879,583	5,685	2,202,964	1,089,690	7,425,344	12,544,227
Texas[1]	..	.....	.....	.....	.....	.....	.....
Totals	97	$37,320,967	13,250	$5,512,428	$1,951,591	$22,770,714	$33,892,315

[1]No returns for 1890. Returned with "all other States" in 1890.

1880.

State.	No. of establishments.	Capital.	Wage-earners, average No.	Wage-earners, Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products.
Maryland	23	$4,962,125	2,763	$905,090		$2,888,574	$4,470,050
Virginia	44	4,329,713	2,522	665,432		1,496,151	2,585,909
West Virginia	20	3,913,616	4,121	1,541,816		3,484,625	6,054,052
North Carolina	20	759,400	63	7,907		11,792	41,085
Georgia	14	1,135,900	1,303	185,489	Not	631,707	990,850
Kentucky	29	5,493,035	4,095	1,344,409	reported.	3,223,799	5,090,029
Tennessee	43	3,681,776	3,077	659,773		1,376,059	2,274,203
Alabama	14	3,509,196	1,626	571,713		691,073	1,452,856
Texas	1	40,000	140	27,720		23,580	36,000
Totals	208	$27,624,761	19,710	$5,909,340		$13,737,360	$22,995,104

SUMMARY.

	1900.	1890.	1880.	Increase. 1880 to 1900.	Increase. 1880 to 1890.	Per Cent. of Increase. 1890 to 1900.	Per Cent. of Increase. 1880 to 1890.
No. of establishments	36	97	208	[1]	[1]111	[1]1.0	[1]53.4
Capital	$44,501,227	$37,320,967	$27,624,761	$7,180,260	$9,696,206	19.2	35.1
Wage-earners, average number	21,773	13,250	19,710	8,523	[1]6,460	64.3	[1]32.8
Total wages	$8,544,752	$5,512,428	$5,909,340	$3,032,324	[1]$396,912	55.0	[1]6.7
Miscellaneous expenses	2,299,084	1,961,591	(2)	347,493	(2)	17.8	(2)
Cost of materials used	41,044,197	22,770,714	13,737,360	18,273,483	9,033,354	80.2	65.8
Value of products	63,603,266	33,382,315	22,995,104	28,710,961	10,897,211	87.7	47.4

[1]Decrease. [2]No returns for 1880.

FOUNDRY AND MACHINE-SHOP PRODUCTS, 1880, 1890, 1900.

1900.

State.	No. of establishments.	Capital.	Wage-earners, average No.	Wage-earners, Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products.
Maryland	113	$6,381,676	4,696	$2,251,777	$456,175	$3,322,658	$8,443,547
Virginia	80	6,963,491	2,912	1,340,143	158,129	2,665,062	4,833,137
West Virginia	62	877,401	591	317,293	45,760	666,244	1,401,852
North Carolina	61	1,017,758	797	273,021	40,200	737,581	1,394,770
South Carolina	26	316,166	324	141,283	16,758	166,849	403,493
Georgia	87	3,398,141	2,384	920,331	173,903	1,590,884	3,506,427
Florida	20	281,643	214	100,584	14,426	87,564	320,507
Kentucky	91	3,445,369	2,790	1,182,942	246,088	2,010,857	4,434,610
Tennessee	94	3,188,971	3,080	1,097,674	181,486	1,854,858	3,961,400
Alabama	74	4,826,825	3,461	1,329,566	298,553	2,755,921	5,482,441
Mississippi	30	390,008	341	159,193	30,963	198,747	489,769
Louisiana	69	2,949,113	1,313	654,053	97,441	1,283,939	2,672,761
Arkansas	36	432,162	275	131,669	26,567	154,875	447,514
Texas	99	2,809,524	1,343	728,553	94,490	1,181,042	2,682,426
Totals	942	$37,278,249	24,520	$10,628,082	$1,880,939	$18,677,081	$40,474,854

1890.

State.	No. of establishments.	Capital.	Wage-earners, average No.	Wage-earners, Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products.
Maryland	81	$4,669,891	3,352	$1,665,907	$241,148	$1,875,508	$4,925,672
Virginia	59	3,238,122	1,971	914,318	129,639	1,206,227	2,730,636
West Virginia	39	482,940	355	169,576	27,737	185,521	506,513
North Carolina	28	684,180	434	167,947	26,457	176,404	488,804
South Carolina	17	516,175	347	175,053	18,419	224,268	511,710
Georgia	52	2,107,969	1,632	732,301	124,362	753,299	2,277,653
Florida	9	158,625	131	72,237	6,219	47,058	155,259
Kentucky	65	5,109,609	2,947	1,512,966	289,727	2,667,393	5,566,321
Tennessee	68	4,348,579	2,620	1,206,152	228,927	1,914,408	4,427,187
Alabama	41	2,355,253	1,460	736,002	113,262	817,023	2,196,913
Mississippi	18	389,700	254	131,162	34,884	307,257	599,951
Louisiana	49	1,658,159	1,095	659,786	59,371	922,559	2,155,586
Arkansas	18	393,757	235	138,577	30,736	87,139	376,150
Texas	59	1,530,156	782	513,083	80,101	735,001	1,874,059
Totals	594	$27,643,115	17,615	$8,785,067	$1,410,989	$11,919,065	$28,786,473

1880.

State.	No. of establishments.	Capital.	Wage-earners, average No.	Wage-earners, Total wages.	Miscellaneous expenses.	Cost of materials used.	Value of products.
Maryland	91	$2,684,358	3,150	$1,509,997		$2,103,112	$4,451,317
Virginia	56	767,400	1,482	396,997		663,167	1,361,231
West Virginia	35	388,300	406	158,474		168,921	469,862
North Carolina	29	189,200	264	77,878		105,340	238,550
South Carolina	18	179,850	314	90,449		137,389	289,502
Georgia	39	916,510	912	343,072		612,483	1,298,491
Florida	1	2,500	8	3,300		1,100	6,000
Kentucky	50	2,283,350	2,031	763,392	Not	1,690,171	3,011,079
Tennessee	50	551,950	766	269,272	reported.	610,824	1,191,531
Alabama	18	297,358	255	101,869		107,605	256,691
Mississippi	17	130,500	147	59,468		70,426	172,200
Louisiana	31	910,625	977	489,896		777,000	1,554,485
Arkansas	12	67,650	109	43,725		52,400	155,509
Texas	30	366,350	360	149,212		228,151	532,778
Totals	477	$9,734,901	10,826	$4,457,001		$7,328,089	$15,029,217

SUMMARY.

	1900.	1890.	1880.	Increase. 1890 to 1900.	Increase. 1880 to 1890.	Per Cent. of Increase. 1890 to 1900.	Per Cent. of Increase. 1880 to 1890.
No. of establishments	942	594	477	348	117	58.6	24.5
Capital	$37,278,249	$27,643,115	$9,734,901	$9,635,134	$17,908,214	34.9	184.0
Wage-earners, average number	24,520	17,615	10,826	6,905	6,789	39.2	62.7
Total wages	$10,628,082	$8,785,067	$4,457,001	$1,843,015	$4,328,066	21.0	97.1
Miscellaneous expenses	1,880,939	1,410,989	(1)	469,950	(1)	33.3	(1)
Cost of materials	18,677,081	11,919,065	7,328,089	6,758,016	4,590,976	56.7	62.6
Value of products	40,474,854	28,785,473	15,026,217	11,689,381	13,759,256	40.6	91.6

[1]No returns for 1880.

Washington, January 13, 1902.

SIGNIFICANCE OF COTTON

By COL. ALFRED B. SHEPPERSON

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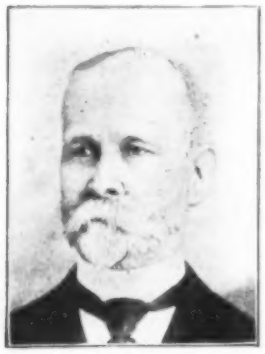
The commercial cotton crop of the United States for the season of 1881-82 was 5,456,000 bales of the average net weight of 450 pounds, while the crop of the season of 1898-99 was 11,256,000 bales, averaging 490 pounds net. The crop of 1881-82 was equivalent to 4,910,000 bales of 500 pounds net weight, and the crop of 1898-99 to 11,031,000 bales of 500 pounds net, thus showing an increase over 1881-82 of 6,121,000 bales of 500 pounds net, or about 125 per cent. These two crops are the smallest and the largest since 1880. Within the same period of twenty years the increased production of India was equivalent to 1,128,000 bales of 500 pounds net, the largest crop being also for the season of 1898-99, and equal to 2,802,000 bales of 500 pounds net. Since 1880 the largest crop in Egypt was that of the season of 1899-1900, and it was equivalent to 1,252,000 bales of 500 pounds net, being an increase over the crop of 1880-81 of 724,000 bales of that weight.



ALFRED B. SHEPPERSON.

It will thus be seen that within the past twenty years the increase in production of the United States has been nearly three and one-half times as great as the combined increase of India and Egypt, the chief competitors of our country in supplying cotton for the spindles of the world. This great increase in the relative production of cotton in the United States has not been from lack of effort in India and Egypt to meet the greater demand from the constantly-increasing capacity of the mills, but is due to the better adaptability of our soil and climate to the successful cultivation of this great staple.

To show the progress of each State, the commercial crops since 1880 are approximately apportioned between the several States as follows, the figures representing thousands of bales:

States.	Season of 1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.	1893-94.	1894-95.	1895-96.	1896-97.	1897-98.	1898-99.	1899-1900.	1900-01.
North Carolina	450	280	450	390	403	390	390	455	460	368	490	415	300	420	470	380	485	615	600	545	515
South Carolina	600	550	620	475	535	566	515	595	550	505	750	675	525	670	770	640	760	950	950	900	825
Georgia	930	800	900	700	834	995	918	1,020	960	1,085	1,210	1,050	800	1,050	1,220	1,025	1,270	1,614	1,570	1,335	1,300
Florida	60	54	60	50	56	68	68	70	64	60	70	60	40	55	65	50	60	70	60	55	50
Alabama	740	700	800	695	745	825	808	835	845	885	1,060	1,010	625	840	950	800	1,000	1,150	1,130	1,070	1,000
Mississippi	950	884	1,000	890	880	990	940	1,095	1,065	1,098	1,265	1,325	855	1,060	1,200	950	1,220	1,600	1,500	1,275	975
Louisiana	500	470	550	485	435	506	500	525	480	560	630	760	430	490	650	480	570	725	600	590	675
Texas, Indian Territory and Oklahoma	1,300	988	1,515	1,135	988	1,391	1,370	1,407	1,463	1,770	2,000	2,400	2,235	1,925	3,210	1,181	2,267	3,189	3,650	2,600	3,915
Arkansas	675	425	700	500	520	540	676	700	700	720	830	925	600	700	880	660	730	930	860	770	800
Tennessee	375	270	325	333	286	278	327	310	325	225	345	378	240	272	350	250	300	325	300	255	250
Virginia & Missouri	26	25	30	30	25	23	20	35	27	21	24	20	14	30	53	31	44	48	36	27	34
Total commercial crop	6,606	5,456	6,950	5,713	5,706	6,575	6,490	7,047	6,939	7,297	8,671	9,018	6,664	7,532	9,837	7,147	8,706	11,216	11,256	9,422	10,239

The progress of cotton cultivation and the disposition of the American crops is concisely shown by the following table:

STATEMENT OF UNITED STATES COTTON CROPS AND EXPORTS, AND THE ANNUAL TAKINGS OF UNITED STATES SPINNERS SINCE 1880.

(In Thousands of Bales.)

Season of	Total commercial crop.	Exports to Europe, Japan, Mexico, etc.	Taken by U. S. Mills. By Northern mills.	By Southern mills.	Percentage of Crop Taken by Northern mills.	Southern mills.	All U. S. mills.
1880-81	6,606	4,565	1,713	225	25½	3½	29
1881-82	5,456	3,551	1,677	287	31	5	36
1882-83	6,950	4,724	1,759	313	25½	4½	30
1883-84	5,713	3,917	1,537	340	27	6	33
1884-85	5,706	3,929	1,437	316	25½	5½	31
1885-86	6,575	4,336	1,781	381	27	6	33
1886-87	6,499	4,445	1,687	401	26	6	32
1887-88	7,047	4,627	1,805	456	25½	6½	32
1888-89	6,939	4,736	1,790	480	26	7	33
1889-90	7,297	4,906	1,790	545	24½	7½	32
1890-91	8,674	5,791	2,027	613	23	7	30
1891-92	9,018	5,858	2,172	684	24½	7½	32
1892-93	6,664	4,390	1,652	723	25⅛	10⅝	36
1893-94	7,532	5,232	1,580	711	20½	9½	30
1894-95	9,837	6,736	2,019	852	20⅝	8⅝	29
1895-96	7,147	4,627	1,605	900	22½	12½	35
1896-97	8,706	5,979	1,793	999	20½	11½	32
1897-98	11,216	7,540	2,211	1,254	20	11	31
1898-99	11,256	7,313	2,217	1,415	19½	12½	32
1899-1900	9,422	5,946	2,047	1,597	22	17	39
1900-1901	10,339	6,538	1,964	1,583	19	15	34

A comparison of the crops for the twenty years preceding the Civil War, 1841 to 1861, with the twenty years from 1881 to 1901 presents in sharp contrast the "New South" with the "Old South." The total of the twenty crops for the earlier period was 57,593,000 bales, against 157,993,000 bales for the twenty years ending August 31, 1901. The gain in the latter over the earlier period was 100,400,000 actual bales, but as the bales are now much heavier than previous to 1861, the gain in cotton production was considerably greater than these figures indicate. The increase, it will be seen, averages over 5,000,000 bales per annum, and yet in 1880 the South was just emerging from the baneful effects of the misgovernment of the "carpet-bag" rule fastened upon it as one of the results of the Civil War.

The above figures represent in thousands the ordinary bales as marketed, though the small cylindrical (or "round") bales, weighing about 250 pounds each, are counted as half-bales.

The mills of Europe and the United States have about 93 per cent. of the cotton spindles of the world, and the following statement shows quite clearly the increasing dependence upon the American crop for the cotton required for these mills:

Season of	United States cotton crop. Bales of 500 lbs. net.	Imported into Europe from other countries. Bales of 500 lbs. net.	Total cotton supply for Europe and U. S. Bales of 500 lbs. net.	Proportion furnished by United States. Per cent.
1880-81	6,051,000	1,622,000	7,673,000	79
1890-91	8,223,000	1,874,000	10,097,000	81
1898-99	11,031,000	1,790,000	12,821,000	86
1900-1901	10,070,000	1,803,000	11,873,000	85

The Census Office has not yet completed its compilation of the acreage and production of cotton for the census of 1900. The following table gives the results of the census of 1890 and 1880:

ACREAGE AND PRODUCTION OF COTTON IN 1889 AND 1879, ACCORDING TO UNITED STATES CENSUS OF 1890 AND 1880.

(Corresponding with Commercial Crops of 1889-90 and 1879-80.)

States.	Census of 1890. Acreage.	Census of 1890. Bales.	Census of 1880. Acreage.	Census of 1880. Bales.
North Carolina	1,147,136	336,261	893,153	389,598
South Carolina	1,987,469	747,190	1,364,249	522,548
Georgia	3,345,104	1,191,846	2,617,138	814,441
Florida	227,370	57,928	245,596	54,997
Alabama	2,761,165	915,210	2,330,086	699,654
Mississippi	2,883,278	1,154,725	2,106,215	963,111
Louisiana	1,270,154	659,180	864,787	508,569
Texas	3,934,525	1,471,242	2,178,435	805,284
Arkansas	1,700,578	691,494	1,042,976	608,256
Tennessee	747,471	190,579	722,562	330,621
Virginia	39,213	5,375	45,040	19,595
Missouri	57,260	15,856	32,116	20,318
Kentucky	2,629	873	2,667	1,367
Kansas	731	212	.....	.....
Indian Territory*	70,078	24,115	35,000	17,000
Oklahoma	1,109	425	.....	.....
Total	30,175,270	7,472,511	14,480,019	5,755,359

*Indian Territory estimated by Census Office in 1880.

The present acreage in cotton is involved in much doubt. For several years the United States Department of Agriculture has made such serious changes from its estimates as at first issued that no great reliance can be placed upon its figures. In May, 1895, it added about 4,000,000 acres as a correction to the previously-issued estimate for 1894. In December, 1899, an addition of 2,300,000 acres was made to the previously-estimated acreage for 1898. In December, 1900, and also in December, 1901, considerable deductions were made from the estimates issued in June of these years for alleged abandonment of acreage before the time for picking. Its estimate issued in June, 1901, for the crop of 1901-1902 as follows:

States.	Acres.
North Carolina	1,476,000
South Carolina	2,533,000
Georgia	3,870,000
Florida	186,000
Alabama	3,362,000
Mississippi	3,124,000
Louisiana	1,401,000
Texas	7,748,000
Arkansas	2,089,000
Tennessee	913,000
Indian Territory	413,000
Oklahoma	308,000
Missouri	59,000
Virginia	52,000
Total	27,532,000

From the great increase in cotton cultivation in the South within the past twenty years the inference must not be drawn that the limit has been or soon will be reached. Texas alone produced in 1900 twice as much as the entire country in 1846. There is suitable land in abundance, and the limit to the increase in cotton culture in the South will only be measured by the supply of labor. The supremacy in cotton cultivation which the South early attained and has continuously held is due in part to the energy and intelligence of its farmers, but chiefly to its possession in a greater degree than any other country of the proper combination of soil, temperature and humidity necessary for the successful cultivation of the plant. These natural advantages will, in my opinion, enable the South in the future, as in the past, to successfully compete with all other countries. The control of this great staple cannot be taken from us, though European nations are constantly striving to promote cotton cultivation in their various colonies. Fast as the spindles of the world increase, it sometimes happens that too much cotton is grown for their immediate requirements. The careful avoidance of overproduction in the South should enable our cotton-growers to control the price as fully as they control the supply.

A comparison with European and Northern mills respecting their annual spindle capacity and consumption of cotton since 1880 will more clearly and forcibly illustrate than any words of mine the marvelous growth of cotton manufacturing in the South.

The following tables give the estimated number of spindles in the United States and Europe in 1880, with their consumption of cotton for the season of 1880-81, and like information for a number of years since then, ending with the past season of 1900-1901:

STATEMENT SHOWING THE PROGRESS OF COTTON MANUFACTURING IN THE UNITED STATES AND EUROPE SINCE 1880.

Season of—	Number of Spindles in Cotton Mills. Northern States of United States.	Southern States of United States.	Total in United States.	Great Britain.	Continental Europe.
1880-81	10,625,000	750,000	11,375,000	40,600,000	21,245,000
1890-91	12,900,000	1,740,000	14,640,000	44,750,000	26,035,000
1891-92	13,250,000	1,950,000	15,200,000	45,350,000	26,405,000
1892-93	13,450,000	2,100,000	15,550,000	45,270,000	26,850,000
1893-94	13,500,000	2,200,000	15,700,000	45,190,000	27,350,000
1894-95	13,700,000	2,400,000	16,100,000	45,400,000	28,250,000
1895-96	13,800,000	2,850,000	16,650,000	44,900,000	29,350,000
1896-97	13,900,000	3,250,000	17,150,000	44,500,000	30,350,000
1897-98	13,900,000	3,550,000	17,450,000	44,900,000	31,350,000
1898-99	14,150,000	3,950,000	18,100,000	45,600,000	32,500,000
1899-1900	14,400,000	4,700,000	19,100,000	45,600,000	33,000,000
1900-1901	14,700,000	5,500,000	20,200,000	46,100,000	33,350,000
Actual increase since 1880.	4,075,000	4,750,000	8,825,000	5,500,000	12,105,000
Percentage of increase since 1880	38⅓%	633⅓%	77⅝%	13½%	57%

ANNUAL CONSUMPTION OF COTTON IN COTTON MILLS.

(*In Bales of 500 Pounds Net.*)

Season of—	Northern States of United States.	Southern States of United States.	Total in United States.	Great Britain.	Continental Europe.
1880-81	1,507,000	187,000	1,694,000	2,858,000	2,365,000
1890-91	1,701,000	550,000	2,251,000	3,384,000	3,631,000
1891-92	1,815,000	616,000	2,431,000	3,181,000	3,640,000
1892-93	1,762,000	660,000	2,422,000	2,866,000	3,632,000
1893-94	1,648,000	639,000	2,287,000	3,233,000	3,848,000
1894-95	1,813,000	806,000	2,619,000	3,250,000	4,030,000
1895-96	1,630,000	840,000	2,470,000	3,276,000	4,160,000
1896-97	1,771,000	946,000	2,717,000	3,224,000	4,368,000
1897-98	1,771,000	1,151,000	2,922,000	3,432,000	4,628,000
1898-99	2,218,000	1,364,000	3,582,000	3,519,000	4,784,000
1899-1900	2,163,000	1,524,000	3,687,000	3,334,000	4,576,000
1900-1901	1,909,000	1,526,000	3,435,000	3,269,000	4,576,000
Actual increase since 1880.	402,000	1,339,000	1,741,000	411,000	2,211,000
Percentage of increase since 1880	26⅔%	715%	102¾%	14½%	93½%

The above figures do not include about 350,000 bales of cotton now grown annually in its Asiatic provinces and used in Russian mills, nor the small quantity of Egyptian and Peruvian cotton used in the United States. This statement includes only the spindles in actual operation, and represents the situation existing at the close of the last cotton season, August 31, 1901. At that time over 500,000 more spindles were being added to the South's capacity by new mills then actually under construction and additions to old mills.

The statistics already presented refer to the Southern States in their entirety, but bring the information practically to date. It is of interest, however, to follow the progress of cotton manufacturing in each State. I have, therefore, compiled from the census reports of 1880 and 1890 and from certain figures of the census of 1900 kindly sent me in advance of their publication by Mr. S. N. D. North, chief statistician for manufactures, the following tables giving the salient features for each State and section. It is proper to add that the census statistics refer to the years ending June 30 of 1900, 1890 and 1880.

STATEMENT OF COTTON MILLS AND NUMBER OF SPINDLES IN THE UNITED STATES, WITH QUANTITY OF COTTON CONSUMED, ACCORDING TO UNITED STATES CENSUS OF 1880, 1890 AND 1900, MARYLAND BEING CLASSED BY THE CENSUS AS NOT IN THE SOUTH.

States.	Number of Mills. Census of 1900.	1890.	1880.	Number of Spindles. Census of 1900.	1890.	1880.	Bales of Cotton Consumed in Census Year. Census of 1900.	1890.	1880.
Maine	15	23	24	841,521	885,762	695,924	157,428	132,504	112,381
New Hampshire	23	27	36	1,243,555	1,095,643	944,053	271,629	214,034	157,673
Vermont	5	6	7	100,028	71,591	55,081	13,048	8,954	7,404
Massachusetts	163	187	175	7,784,687	5,824,518	4,236,084	1,106,154	772,520	574,857
Rhode Island	71	94	115	1,880,622	1,924,486	1,764,569	186,508	193,291	167,480
Connecticut	55	65	82	1,000,574	934,155	936,376	109,111	104,655	109,703
New York	34	42	36	720,268	606,796	561,658	102,590	78,824	64,614
New Jersey	20	17	17	431,730	374,442	232,221	29,644	25,723	21,069
Pennsylvania	150	158	59	306,637	439,638	425,391	76,425	92,705	83,997
Delaware	3	7	8	34,552	53,916	46,188	2,675	8,876	7,512
Maryland	14	15	19	154,064	158,930	125,706	80,954	55,026	51,537
Ohio, Illinois, Iowa, Nebraska, Michigan, Minnesota, Utah, California and Colorado.	7	13	9	74,288	47,030	25,428	17,650	19,402	8,638
Indiana & Wisconsin	7	10	5	123,984	107,193	43,396	24,449	23,230	14,731
Total in Northern States	567	664	592	14,696,510	12,524,100	10,092,075	2,178,265	1,729,744	1,381,596
Virginia	7	9	8	126,827	94,294	44,340	38,118	22,731	11,461
North Carolina	177	91	49	1,133,432	337,786	92,385	404,535	114,371	27,642
South Carolina	80	34	14	1,431,349	332,784	82,334	485,234	133,342	33,624
Georgia	67	53	40	815,545	445,452	198,656	304,136	145,859	71,389
Alabama	31	13	16	411,328	79,234	49,432	134,371	26,924	14,702
Mississippi	6	9	8	75,122	57,004	18,568	20,962	17,366	6,411
Tennessee	17	20	16	123,896	97,524	35,736	30,273	33,114	10,436
Kentucky	6	5	3	66,633	42,942	9,022	23,982	11,980	4,050
Louisiana, Texas, Arkansas and Missouri.	11	6	10	127,710	76,983	30,887	40,737	23,131	9,033
Total in Southern States	402	240	164	4,311,842	1,564,003	561,360	1,482,348	528,818	188,748
Total in the United States	969	904	756	19,008,352	14,088,103	10,653,435	3,660,613	2,258,562	1,570,344

STATEMENT OF CAPITAL EMPLOYED IN COTTON MILLS IN THE UNITED STATES, AMOUNT ANNUALLY PAID FOR WAGES OF OPERATIVES, AND AVERAGE NUMBER OF OPERATIVES EMPLOYED, FROM CENSUS REPORTS OF 1900, 1890 AND 1880.

States.	Capital Employed. Census of 1900.	1890.	1880.	Amount Paid for Wages. Census of 1900.	1890.	Average No. of Operatives Employed. Census of 1900.	1890.
Maine	$21,087,000	$20,851,000	$15,292,000	$4,330,000	$4,372,000	13,723	13,992
New Hampshire	29,262,000	26,802,000	19,877,000	6,759,000	6,429,000	20,454	19,533
Vermont	1,933,000	1,432,000	936,000	260,000	221,000	1,015	737
Massachusetts	155,761,000	128,839,000	72,292,000	32,327,000	26,231,000	92,085	76,213
Rhode Island	37,274,000	38,798,000	28,047,000	7,297,000	8,131,000	21,823	24,832
Connecticut	27,352,000	26,432,000	20,310,000	4,393,000	4,524,000	13,194	13,411
New York	14,509,000	13,291,000	11,400,000	2,582,000	2,564,000	8,659	8,401
New Jersey	13,989,000	13,520,000	3,808,000	1,887,000	2,054,000	5,518	5,683
Pennsylvania	22,386,000	15,885,000	10,332,000	5,602,000	4,687,000	15,567	12,960
Delaware	485,000	1,684,000	874,000	139,000	324,000	372	987
Maryland	7,709,000	7,297,000	4,601,000	1,186,000	1,134,000	4,727	4,313
Ohio, Illinois, California, Minnesota, Michigan, Colorado, Utah, Nebraska, Iowa.	2,209,000	2,125,000	955,000	411,000	396,000	1,339	1,129
Indiana and Wisconsin.	2,146,000	2,637,000	1,290,000	405,000	475,000	1,768	1,826
Total in Northern States	$336,102,000	$299,593,000	$190,014,000	$67,578,000	$61,542,000	200,244	184,017
Virginia	$4,403,000	$2,967,000	$1,190,000	$669,000	$407,000	2,931	2,019
North Carolina	33,012,000	10,775,000	2,856,000	5,127,000	1,646,000	30,273	8,742
South Carolina	39,259,000	11,142,000	2,776,000	5,067,000	1,647,000	30,201	8,192
Georgia	24,158,000	17,665,000	6,349,000	3,567,000	2,366,000	18,283	10,539
Alabama	11,639,000	2,853,000	1,247,000	1,482,000	447,000	8,332	2,137
Mississippi	2,210,000	2,054,000	1,122,000	340,000	291,000	1,675	1,184
Tennessee	3,768,000	2,929,000	1,146,000	423,000	495,000	2,108	2,174
Kentucky	1,868,000	1,376,000	360,000	280,000	189,000	1,351	834
Louisiana, Texas, Arkansas and Missouri.	4,424,000	2,667,000	1,220,000	593,000	459,000	2,531	1,756
Total in Southern States	$124,741,000	$54,428,000	$18,266,000	$17,548,000	$7,947,000	97,685	37,568
Grand total in United States	$460,843,000	$354,021,000	$208,280,000	$85,126,000	$69,489,000	297,929	221,585

The value of the production of all the United States cotton mills is given by the Census as $332,804,000 for 1900, $267,982,000 for 1890, and $192,090,000 for 1880. The number of operatives in 1880 were 174,659, and the wages paid were $42,040,000.

Comparing the figures for four of the most important States of each section, they show that the increase in spindles reported by the census of 1900 over that of 1880 was for Massachusetts 3,549,000, or 84 per cent.; South Carolina, 1,349,000, or 1650 per cent.; New Hampshire, 300,000, or 32 per cent.; Georgia, 617,000, or 312 per cent.; Rhode Island, 116,000, or 6½ per cent.; Alabama, 362,000, or 740 per cent.; Connecticut, 64,000, or 7 per cent., and North Carolina, 1,041,000, or 1127 per cent.

Cotton is usually the most important in value of our exports to foreign countries. How large a part it plays in keeping the balance of trade with Europe

in our favor, and thus enabling us to retain our gold at home and to maintain our currency firmly upon the basis of the gold standard, is shown by the following statement compiled from Treasury Department reports, giving the value of the principal articles exported annually since 1880:

Year ending June 30	Cotton.	Breadstuffs, comprising wheat, corn, oats, flour, etc.	Provisions, comprising meat and dairy products.
1881	$247,695,746	$270,332,519	$156,809,840
1882	199,812,644	182,670,528	122,020,530
1883	247,328,721	208,040,850	109,217,119
1884	197,015,204	162,544,715	114,353,788
1885	201,962,458	160,370,821	107,232,456
1886	205,085,642	125,846,558	90,625,216
1887	206,222,057	165,768,662	92,783,286
1888	223,016,760	127,191,687	93,058,080
1889	237,775,270	123,876,661	104,122,444
1890	250,968,792	154,925,927	136,264,506
1891	290,712,898	128,121,656	139,017,471
1892	258,461,241	299,363,117	140,262,159
1893	188,771,445	200,312,654	138,401,591
1894	210,869,289	166,777,229	145,270,643
1895	204,900,990	114,604,780	133,634,379
1896	190,056,460	141,356,993	131,503,590
1897	230,890,971	197,857,219	137,138,084
1898	230,442,215	333,897,119	167,340,960
1899	209,564,774	273,999,699	175,508,608
1900	241,832,737	262,744,078	184,453,055
1901	313,672,443	275,594,618	196,959,637

Though the increase in the cotton production of the South since 1880 has been remarkable, the great expansion of its cotton-manufacturing industry has been simply wonderful. The South's rapid and continually increasing progress in cotton-spinning is now and has been for twenty years one of the most notable features of the cotton situation. During the season of 1900-1901 the consumption of cotton by the Southern mills was 715 per cent. greater than for the season of 1880-81, against an increase during the same period of 27 per cent. by the Northern mills, 15 per cent. by the British mills and 94 per cent. by the mills of Continental Europe. To avoid fractions, I have slightly overstated the percentage of increase by the mills of the Northern States and of Europe.

There are many and manifest reasons for the increase in cotton manufacturing in the South. The Southern mills possess the advantages of proximity to the cotton fields and a climate which insures them against those interruptions to work which in severe winters are causes of inconvenience and loss to some of the Northern mills. Other advantages over the Northern mills are cheaper land (for sites for factories and dwellings for operatives), cheaper building material of all kinds, cheaper fuel and labor, and longer working hours. Nearness to the cotton fields means not only a saving in cost of transportation and the reduction to a minimum of the inevitable loss of weight in handling, but it means also a better selection and lower price. Southern mills buy much of their cotton direct, and thus save the profits and charges which the Northern mills have to pay to brokers and middlemen.

Writing two weeks ago, my friend, Mr. Thomas Ellison of Liverpool, who is not only the ablest cotton statistician in the world, but also a very close observer of passing events, said "it looks as if the South will very shortly consume more cotton than the North."

I heartily agree with him that it is only a question of time when the Southern mills will undoubtedly use more cotton than those of the Northern States.

There is a constantly increasing tendency on the part of our Northern mills to manufacture the finer descriptions of goods and yarns, leaving the market for the coarse and some of the medium kinds to the Southern mills, whose competition in these grades they cannot meet. There is room in the rapid extension of the commerce of the world for the absorption of the production of all of our cotton mills, even should they increase in the future in the same measure as in the past, provided the policy of our government is so shaped as not only to retain our present export trade, but to expand it by the opening up of new markets.

Awakening to Industrial Possibilities

By J. T. HARAHAN

Second Vice-President Illinois Central Railroad

The industrial and agricultural progress of the South during the past twenty years, and particularly during the past ten years, has been little short of marvelous, but the development of its resources has only begun, and I am of the opinion that the next twenty years will witness a still more rapid and substantial advancement.

Many people not conversant with the conditions in the South have an idea that it depends almost entirely upon the cotton crop for its prosperity. They overlook many of its natural advantages—the large beds of iron ore and coal and the vast acreage of valuable timber lands which have done so much in recent years to bring it to the fore industrially. The lands are being rapidly cleared and put under cultivation. Rich, fertile soil is more general in the South than in any other section, and during recent years the crops raised are becoming more and more diversified, and the Southern States are getting less dependent every year upon their cotton crop, and consequently upon their Northern and Western neighbors for corn and other grains. There has also been a notable increase in the fruit and vegetable business of the South. A large portion of the early fruits and vegetables raised in the South is shipped North. This industry is still capable of much development, and bids fair to assume a far greater magnitude in the near future. Cotton factories and other kindred manufacturing plants which were formerly confined almost entirely to the North are now being rapidly located in the South, where they save the long haul on the cotton, and also get at low cost the coal and other raw materials needed. The manufacture of cottonseed oil and cake has also come during recent years to be one of the most important industries of the South, and is increasing rapidly.

It is only within the past few years that the great value of their extensive forests of pine, cypress and hardwoods has come to be understood and appreciated. At no time in the history of the South has there been so many large lumber-manufacturing plants under construction or as much demand for Southern lumber as at present, and the prospects for a continuance of the rapid growth of recent years in the manufacture of lumber and timber products in the Southern States are very flattering.

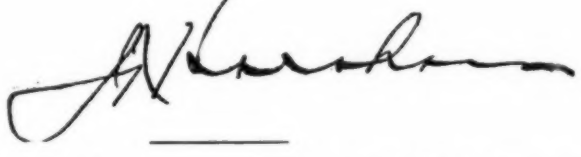
In the extreme southern part of the Mississippi valley the refining of sugar and molasses is a very important industry. In Louisiana alone the number of establishments has grown from thirty-eight in 1890 to 384 in 1900, and the capital so invested from $1,943,601 to $52,799,105 in 1900, the value of the products increasing from $12,603,913 to $47,891,691.

In the State of Louisiana the number of manufacturing establishments increased from 1553, with a capital of $11,462,468, in 1880, and 2613, with a capital of $34,754,121, in 1890, to 4350, with a capital of $113,084,294, in 1900, the value of the products increasing from $24,205,183 in 1880 and $57,806,713 in 1890 to $121,181,683 in 1900.

In the State of Mississippi the number of manufacturing establishments increased from 1479, with a capital of $4,727,600, in 1880, and 1698, with a capital of $14,896,884, in 1890, to 4772, with a capital of $35,807,419, in 1900, the value of the products increasing from $7,518,302 in 1880 and $18,705,834 in 1890 to $40,431,386 in 1900. I have not now before me similar data for all the other Southern States, but such as I have indicates that the progress in the other States has been in about the same ratio. The South is just awakening to its industrial possibilities, and it seems quite clear from the present outlook that the next twenty years will witness great development in that direction.

The increase in the volume of grain, forest products and other freight exported through the Gulf ports during the past ten years has been something phenomenal. Much of the grain now being exported through the Gulf and South Atlantic ports formerly left the country through the North Atlantic ports. The imports through the Gulf ports are also increasing steadily. The Gulf and South Atlantic ports are the natural channels through which the export and import business of the Southern States should be handled, and with the many improvements in facilities at these ports now under way or in contemplation, which will enable this traffic to be handled more quickly and economically, there is bound to come to the South a far greater proportion of this country's export and import business than heretofore.

To my mind, there is no section of our country to which the future holds forth such rosy prospects as the South.



GADSDEN, ALA.

Abundant Resources in Ore, Coal and Timber the Foundation for Manufacturing Progress.

With its numerous lines of important railroads and its surrounding wealth of iron ore, timber, etc., it is small wonder that Gadsden, Ala., is one of the most thoroughgoing little cities of the South today, and that it can truthfully be said that however much other cities may have felt the depression following the boom days of ten years and more ago, Gadsden has stood manfully to the fore through it all, and is today in a much more solid financial and industrial condition than ever before in its history. Within a range of from five to fifteen miles of Gadsden there is an enormous quantity of high-grade red iron ore, which is mined on a large scale. Much of it is shipped to Chattanooga, Birmingham and other points, while the Gadsden furnace, owned by the Alabama Consolidated Coal & Iron Co., one of the best in the South, with a daily capacity of nearly 150 tons, consumes this ore almost exclusively. The company has made large purchases of ore properties, and is developing them on a considerable scale not only for supplying its own needs, but for shipment to other furnaces owned by this company.

In addition to its iron ores, the coal fields which have recently been opened within a few miles of Gadsden must prove of great commercial and industrial importance to the city, as the coal is of a superior quality, and the supply is believed to be practically inexhaustible.

The cotton mills of Gadsden have long been noted for the excellence of their product, and it is no stretch of the fancy to picture the untaught natives of our farthest possessions dressed in the cotton checks of the Gadsden mills while watching the building by American engineers of bridges made from Gadsden iron.

The situation of Gadsden is picturesque and pleasing, located as it is among the foothills of the Southern Appalachian range, on the banks of the beautiful Coosa river. The river is navigable all the year, a fact which assures to the merchants and manufacturers of the city the most favorable freight rates on their shipments into and out of the city.

There are forests of hardwood nearby, and it is the ambition of Gadsden to secure not only numerous iron industries, but woodworking establishments as well. With the organization of the Gadsden Commercial Club, a few months ago, there have been more systematic and energetic efforts made to secure industries and settlers for the fine fruit and farm lands of the section than ever before, and the organization has infused new life and activity into the entire community. A hearty welcome is extended to outside capital, although most of the present undertakings are backed by local money. But the advantage of foreign assistance is so fully recognized that special efforts are now being put forth to secure the co-operation of outsiders, and all new industries are to be exempt from taxation, both city and county, for a period of five years, and free sites are offered to all legitimate, meritorious manufacturing enterprises which will locate here.

All the advantages of churches, schools, electric-car lines, a long-distance telephone company, ample banking facilities and a charming, hospitable society are possessed by Gadsden, and with the many social, climatic, commercial and industrial attractions, the people of this thriving city feel that the continued growth and prosperity of the community and section are assured.

Detailed information concerning the city and its advantages will be furnished by Mr. Otto Agricola, president, or Mr. A. T. Stocks, secretary, of the Gadsden Commercial Club, or by any city official.

How Fair Acadia Became a Great Rice Centre

By WILL M. STEELE

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The average reader of Longfellow's beautiful "Evangeline" does not know that his "Acadie" and his "forest primeval" were located in Southwest Louisiana, and very few of them know that that forest primeval is gradually passing away under the relentless hand of human progress, and that beautiful expanse of wide prairie in "Belle Acadie" has been turned into waving golden fields of rice; that human thrift and energy has stretched its long arm into the poet's paradise, and transformed it into a scene of bustling activity and commercialism, where thousands earn a handsome competence in place of the few hundreds who formerly eked out an existence.

WILL M. STEELE.

Acadia parish has been the home of the Acadians ever since their ancestors left the shores of Nova Scotia. These simple people, honest and industrious, are scattered in half a dozen parishes of South and Southwestern Louisiana, but in no part of the State did they retain their primitive customs and habits, and primarily their abhorrence of any innovation, in a greater degree than in the southwestern corner of St. Landry, which, in 1886, was cut off and formed into the new parish of Acadia. That marked the first actual step in the transformation scene. Apathy and contentment have given way to energy and desire, and with the aid of thrift and industry, nature is being made to yield up her golden reward.

The story of the development of Acadia parish and the building of the town of Crowley, now admittedly the largest rice market in the United States, reads like a romance. The central figures are William W. Duson and his younger brother, Cornelius C. Duson. Sixteen years ago W. W. Duson had not a dollar in the world. He was in debt. Today he is one of the richest men in the southwestern part of the State, but his opulence has not changed him. The people who have risen to wealth with him and those who have been less fortunate do not envy him. He is the same genial, whole-souled, plain and unpretentious man that he was twenty years ago. Born not far from the scenes of his present success nearly fifty years ago, he was raised to manhood on a little farm on the outskirts of what is now the town of Crowley. He started out in life working on the farm, and then opened a small country store, with a partner, in a typical Acadian town called Plaquemine Brulee, some miles away, but in the same parish, which was then St. Landry. After some years he came to the conclusion that merchandising was not his forte, and he gave it up, turning all his available assets over to his creditors. He moved to the larger town of Rayne, then composed of some 600 people (and it has not increased materially since), and started to rebuild his shattered fortunes. There it was that he sowed the first seeds of his subsequent career. He opened a land office, and began locating farmers on homesteads. He studied the territory thoroughly, and conceived the idea that it was an ideal country for farming purposes and had a great future before it. His predictions were looked upon as idle dreams, because everybody had said that the vast expanses of prairie could never be turned into anything but a cattle pasture. He persevered, and began writing to Western farmers, pointing out the advantages of the locality. He brought quite a few South by his own individual effort, and then he turned his attention to his adopted town, Rayne, and tried to instil a little enterprise into it. He wanted to make it the metropolis of that part of the State. But while he saw the picture of the future clearly and distinctly, he could not make others see it. Finally, he gave it up. He announced that he would build a town on the outskirts of Rayne that would realize his dream and overshadow it.

That was sixteen years ago. He kept his word. Today the town of Crowley stands as the monument to his foresight, with nearly 6000 people. In order to carry out his project he had to have capital, so he organized the Southwestern Louisiana Land Co., which was composed of himself, his brother, and Alphonse Levy, a St. Landry merchant of some means. Later Joseph Bloch of Opelousas and Dr. J. Gray Thomas of Mobile were added to the corporation. A prairie plot on the railroad was selected and the new town staked off. Steps had been taken to form the new parish, and when the new town began to assume form the new parish of Acadia had come into existence largely through the efforts of C. C. Duson. The town was symmetrically designed, with an avenue 115 feet wide and 20-foot sidewalks running north and south and a similar avenue running east and west. At the intersections of the avenues a square was laid out for the courthouse, and it became necessary to make a campaign through the parish to have the new town selected as the parish-seat. It was an up-hill fight. Crowley was still almost entirely on paper, and there were several towns with a few hundred inhabitants, some of them boasting a history dating back a century. But in 1888 Crowley won out by sixteen votes, and became the parish-seat. The Duson brothers had to work against overwhelming odds from the very outset, but their indomitable will and perseverance overcame all obstacles. They did not even have the satisfaction of naming their new creation. There had been a switch just below the proposed townsite which was known as Crowley's Switch, having derived its name from that of the superintendent of the railroad, who had charge of that division of the Southern Pacific. The residents of Rayne and other towns, in visiting the site of the new town, always referred to it as Crowley's Switch, and the name held so that Messrs. Duson and their associates concluded that it would be futile to attempt to change it. So when the houses began to go up and the new town assumed shape and became incorporated it was given the name of Crowley. The unwitting godfather of the new town, by the way, was a resident of Lake Charles, a large town further west, and served several terms as mayor of that place. His full name, or rather the only name by which he was known in that section, was "Pat Crowley." Among the essentials of every town on a railroad line are a station and a telegraph office. Messrs. Duson interviewed the division superintendent, and told how in the course of a few months a large and flourishing town would be on the site of Crowley, and asked that a railroad station be built there. He could not see it, and referred the promoter to a higher authority. He went along the line of all the officials, but they could not imagine that a piece of waste prairie land could be transformed into a town by the efforts of one man and his lieutenants, and declined to build the station or have the trains stop there. After the expenditure of considerable energy, and by the exercise of unrelenting persistence, the railroad company was finally induced to allow the promoters, at their own expense, to move an old frame station-house from a little station a few miles west, and gave orders, rather unwillingly, that trains should stop there. Then there was the telegraph company to be reckoned with. They were obdurate, and for three months Duson Brothers were obliged to pay the salary of the lone telegraph operator and station agent, besides paying the Western Union Company $100 for running a wire into the town.

After these preliminaries had been settled the promoters could then devote their attention to building up the town. To accomplish this it was necessary to create a raison d'etre for the town by filling the surrounding country with farmers. To the average resident of that part of the State that seemed an impossibility. They had lived there all their lives and their fathers before them, and what could a farmer want with lands that were only fit for grazing purposes, and not very well adapted to that, even? There were hundreds of thousands of acres of land, but it had been cultivated only along the banks of the streams. The rest were useless, because of the impossibility of watering it. They knew that the fertile lands along the streams were admirably suited to the cultivation of rice, for had they not for the past 100 years been cultivating enough for their own needs? But all the land along the streams was taken up, and the newcomers would have to go to the prairie wastes, where they would starve. Shortly after the Civil War a colony of Germans settled in the southwestern part of St. Landry parish, forming what is known today as German Settlement. Like the natives, they undertook the cultivation of rice. They were not content with utilizing the small strip of land along the bayou; they needed more land. With the thrift and industry characteristic of the race, they took up the prairie lands, and devised a plan to store up water for their crops. Rice is a plant that requires a vast amount of water, and to supply this the thrifty Germans built levees around the elevated portions of their land and planted their rice in the lowlands The rainfall accumulated in these reservoirs, and when water was needed for the crop, the field, which had also been leveed, was flooded. Their methods of raising and harvesting the crop were very primitive. The rice was cut with sickles, dried in small stacks, threshed with flails, and the rice separated from the chaff by pouring from one vessel into another, with the wind as the separator. When there was no wind, work was suspended until Providence sent them one. The first man to send any rice to market from this section was named Fabacher, and his oldest son is now one of the wealthiest men in New Orleans. That was twenty-two years ago. The rice was sewed in small sacks and hauled across country in carts to Opelousas, and thence shipped to New Orleans to be milled. While some of the natives followed the example of the thrifty Germans, the total shipments of rice were insignificant. Farming rice for market did not begin to grow into an industry of any consequence until W. W. Duson & Bro. began to bring the hardy farmers of the West. They enlarged upon the ideas of the Germans, introduced up-to-date farming methods, and soon made that whole section blossom as the rose. The success of the few pioneers induced others to follow, and they, in turn, demonstrated to those left behind that here, indeed, was an Eldorado which required only common sense and industry to yield up not only a comfortable living, but handsome profits. It was a land in which the farmer found the promise of a bright future. It was land that required no working after the crop had been sown. All the farmer had to do was to keep water on the crop and wait until it had ripened and was ready for harvest. It was land that was cultivable, every inch of it, and the farmer did not have to dig out the stones or hesitate to plow deep because of fear of striking rock. When the farmers of the West came to Acadia they brought with them their wheat harvesters and threshers, and when these wonderful machines were first put to work in the rice field the natives stood around in open-mouthed amazement, and some of them said they were instruments of the evil one. They could not conceive of modern farming methods being applied in the soggy rice field. The newcomers found that they would have to adapt their implements to the new conditions; but they possessed the spirit of the pioneers of old, indomitable will and tireless energy, and eventually they triumphed over natural obstacles that at first seemed insurmountable. Go into an Acadian rice field today, and then let your imagination conjure up the picture that that same field would have presented fifteen years ago. It is almost incredible, for the one represents a revolution in methods that date back to the time of Moses.

It is as strong a contrast between the ancient and modern as could well be imagined. Today one harvesting machine, as it moves majestically through the undulating sea of golden rice, the rhythmic music of its mechanism floating on the summer air, operated by one man and five mules, does in one day what formerly took a whole family and hired help to do in a season. And then in place of the ancient flail, the thresher, having made a contract with the farmer to thresh his crop at a stated period, comes around, and in a week or more, according to the size of the crop, it is all threshed and sacked and ready to market. The wealthy farmers all own their own threshing machines now, but for the small farmer there are contractors who thresh the crop at the rate of ten cents per sack of a little less than 200 pounds.

With the rush of new settlers it soon became evident that even the improved method of storing up rainfall would not meet the needs of the large number of farmers, and a more certain and regular method of irrigation would have to be devised. Heretofore Providence was still an important factor in making a crop. If there was a particularly dry season, the rice crop was in danger of being ruined. Some system had to be devised whereby the farmers would not have to depend on the kindness of Providence for their crops. The first attempt to irrigate the land by means of pumps and canals was made in 1890 by C. C. Duson about two and one-half miles from Crowley. It resulted in failure, because the vacuum pumps would not work. The water was too warm. Fortunately for the farmers, the next two years were very wet years, and "Providence rice" was very successful and the need for irrigation was not so apparent. Then came a drought, and man's ingenuity had to be invoked to supply the omission of nature. The first successful pumping plant and canal system was put in operation during the season of 1894 with Ivens pumps, and the result of its operation was a wonderful impetus to the rice industry. It convinced the farmers that they could raise a crop under any and all conditions, that they were no longer dependent on Providence, that certainty had taken the place of uncertainty, that when they sowed their field in the late spring they could count with almost absolute precision on the proceeds of the crop they would harvest in the early fall. It marked a new epoch in agriculture, and its importance has not been appreciated by the people at large.

This pioneer canal was built by the Dusons to irrigate their farm, two and one-half miles northwest of Crowley, and it was subsequently sold to the Abbott brothers, who built a mile and one-half extension and watered their own lands. Every year thereafter it was extended and the capacity of the pumping station increased to meet the increasing demand for water. The first year there was one 16-inch Ivens pump with a 125-horse-power engine, with a capacity of 15,000 gallons per minute. The capacity of this plant is now 60,000 gallons per minute, furnished by four 18-inch pumps, supplied by a 450-horse-power Corliss engine and two 125-horse-power Chandler & Taylor engines.

From this small beginning there have grown 200 miles of main canals and about 1000 miles of laterals, which water nearly 150,000 acres of land. These canals represent a capital of nearly $2,000,000, and are like the blood-vessels of a human body. The life-giving fluid courses through them to fertile fields, and vegetation blossoms at its magic touch. Each acre of rice requires about 13,000 gallons of water every twenty-four hours, so the undertaking to supply an entire section is not a small one. The longest of the main canals is twenty miles, and besides watering over 3000 acres of land for its owner, supplies over 100 other farms, comprising 15,000 acres additional.

The pumping stations for the canals are located at the sources of supply—a river or bayou. The natural slope of the land towards the water necessitates the building of a wooden flume from ten to twenty feet above the ground, and this extends sometimes for a distance of half a mile until level ground is reached. Then begin the canals proper. The canals are simply enclosures, made with levees of earth from four to six feet high. The bottom of the canal is, of course, level with the ground. The main canals vary in width from 100 to twenty feet, and at intervals the laterals extend into the rice fields. The laterals vary in width from five to twenty feet. The rice field is enclosed in small levees to retain the water, and when the rice is a few inches above ground the inlet is opened and the field flooded. It is covered to a depth of several inches, and the water remains on it until just before harvesting time, when the levees are cut and the water drained off. The ground is then allowed to dry, so that the harvesting machines can be operated.

The farmers make their contracts with the canal company in the spring for the supply of water. The invariable toll is one-fifth of the crop produced. The canal companies know they have a certainty on the crop, and can afford to take their pay on this basis. It is not only profitable to the canal-owners, but to the farmers as well. He is practically given a guarantee that he will make the entire crop which he plants. All elements of uncertainty are removed. No matter how dry the season, he knows that his field will be continually flooded. The seasons vary. When there is a very dry summer it is necessary to pump more water, and the expense falls upon the irrigating companies. When the season is wet they reap the benefit of the lessened expense. For instance, the season of 1900 was a very wet one, and the pumping stations were worked only about thirty days of twelve hours each during the entire summer while the crop was growing. The season of 1901 was a very dry one, and some of the plants worked night and day for 90 to 120 days of twenty-four hours. The toll was the same—one-fifth of the crop.

The net profit to the farmer varies from $40 to $60 per acre, and there are some cases where it has run to $75. These, of course, are not very common. But contrast $40 an acre profit with the profit of the best wheat farmers, and note the difference. And that is looking at it from a purely financial point of view. Then consider that the rice farmer has only to work his ground once, sow his crop in the late spring or early summer, then wait until it is ready to harvest. He has practically nothing to do six months in the year. If he is industrious he can use his land twice, and the change of crop, instead of impoverishing the land, will improve it, if anything. Fertilizers are an unknown quantity in this section.

The farmer is always sure of a market for his crop, because the use of rice is steadily increasing all over the country. Aside from the ever-increasing domestic demand for the higher qualities, the islands of Porto Rico and Cuba are large consumers, and the former within the last two or three years has been taking all of the poorer grades of Louisiana rice.

Until eight years ago the farmers of Acadia parish had to depend on the New Orleans market for the sale of their product. They found it profitable until they raised two or three enormous crops in succession and there was a combination of New Orleans millers effected. The consequence was a drop in the price of rough rice, which shook the rice farmers up considerably. They concluded that their only salvation was to mill their own rice, and they stood not upon the order of their doing it, but went about it with their characteristic energy. They built one mill in Crowley. It proved a wonderful success, aided in a measure by the restoration of normal conditions in the matter of supply and demand. Then other mills followed, until now there are eight modern rice mills in the town, and a dozen, largely owned by Crowley people, in surrounding towns, which now mill the greater proportion of the crop of Southwestern Louisiana rice. These mills have done away with the middlemen. They deal direct with their own brokers in every city in the country, and have no trouble in disposing of their product. The mills work independently of each other. The rough rice is brought to the mill warehouse by the farmer in sacks varying in weight from 150 to 200 pounds, according to the quality of rice. The country mill operates on the toll system, charging forty cents per barrel for milling, then sells the clean rice for account of the farmer. The expert can pretty well determine what the finished product will be in quality and amount when the rough rice is brought to the mill. The mill gets from the 162 pounds of rough rice 100 pounds of clean rice, twenty pounds of chaff, dirt, waste, etc., thirty-five pounds of rice bran and five pounds of rice polish. The hulls or chaff are burned under the boilers. The bran is sold for cattle food, and the rice polish is exported, mostly to Germany, where it is used in making articles in imitation ivory. The polish is the fine white powder residue from the final polishing of the cleaned rice.

The eight rice mills of Crowley now have a daily 24-hour capacity of about 10,000 barrels of clean rice. Each mill has its own warehouse, and besides, there are four independent warehouses, one of which has a capacity of 80,000 sacks.

The total rice crop of Southwestern Louisiana is figured at 2,000,000 barrels this year. Of this amount Crowley received over 1,000,000. And fifteen years ago there was not even a house to mark the site of the future town. Its growth and development sounds like a tale from the Arabian Nights. But there is this difference: It is permanent and continuous. There is nothing of the Western boom town about Crowley, except that it was built out of nothing. The tributary farming industry had to be created to make business for the town, and then they both flourished in unison, each contributing to the prosperity of the other, until now they stand upon a solid foundation, have capital, industry and enterprise in abundance, and are independent. Most of the land where Crowley now stands was bought by Mr. Duson and his associates for a dollar an acre. The other day a lot on the main business street 50x100 feet was sold for $10,000. One of the gentlemen now associated with Mr. Duson, but who came from the great Northwest ten years ago, bought 100 acres of land from him near the northern limit of the city for $6 per acre. Two years ago Mr. Duson bought it back from him at $60 per acre, and recently refused $100 an acre for it. That, in brief, is the story of the appreciation of land values in that section as the result of the rice development and the growth of Crowley. There is still a quantity of good land to be had for from $25 to $50 per acre, but there is none in the immediate vicinity of the town.

The first store opened in Crowley was run by J. Frankel, who had been conducting a modest business in Opelousas. He had faith in the Dusons and their policy, and built himself a little wooden structure, one of the first half-dozen buildings erected on the site of the town. He was also the first postmaster, and the postoffice was a starch box placed on the end of his counter. Today Mr. Frankel is president of one of the banks, is interested in several irrigation companies, owns considerable real estate, and is reputed to be worth $250,000. The president of another bank, who is now among the wealthy citizens of the place, came to Crowley ten years ago a barefooted youth from Mississippi, and worked for awhile as a clerk in a store. Every dollar of his money is the result of his own industry and the opportunities of that section. Another resident of Crowley, who is said to be worth $500,000, came to Crowley in its infancy with a pack on his back peddling notions. There are dozens of other instances not quite so pronounced which go to show how thrift and industry have turned into gold the opportunities of nature. These men have made a city in the wilderness. All of their interests are tied up in its future, and they will not let it stop in its path of progress.

Crowley had by the census of 1900 4300 inhabitants. The town council last summer had a special census taken, and it showed a population of 5810. This shows an actual gain of 1500 in one year. It has everything that could be expected of a town of that size. The streets are all well laid out and sprinkled in dry weather. The main avenues, running north and south and east and west, intersecting each other at the courthouse square, are 115 feet wide, with 20-foot sidewalks. All the streets running north and south are avenues eighty feet wide, while the streets running east and west are sixty feet wide. Parkerson avenue is the main business street, and while the eastern portion of Hutchinson avenue boasts many fine residences, they are not confined to that avenue. There are many dwellings which cost, exclusive of the ground, $8000 to $10,000, and one residence just completed, occupying an entire square of ground, cost $20,000. Frame buildings are rapidly giving way to modern brick structures with ornamental fronts, and it is hoped that before another year passes every frame building will have disappeared There are now a dozen blocks of brick buildings, and construction is in progress in several blocks. Business has to go on just the same, so the owners of the frame buildings are allowed to move them out into the wide street and carry on their business while the brick building is going up. Then the old one is demolished and sold for firewood. The courthouse is rather out of date, although only fourteen years old, and built at the expense of the promoters of the town.

The police jury of the parish has recently appropriated $75,000 for a new one, and, occupying such an admirable site, it will add considerably to the attractiveness of the town. There is an opera-house which cost $30,000, as fine as any in the State outside of the city of New Orleans. On a corner opposite Courthouse Square stands the city hall and public market, an ornate brick structure, which cost $25,000. Farther out on Parkerson avenue is the high-school building, an up-to-date brick structure, which cost $25,000, and which has a heating and ventilating apparatus which cost $5000 more. Besides the ward public school, which has four grades, there are several private schools. It is the intention of the town corporation to petition the next legislature to set them apart as a separate school district, as is the case in New Orleans and Shreveport, so that all the school tax raised in the town will go to the town, and not be distributed throughout the parish, as is now the case. When that is done a complete public-school system will be installed commensurate with the needs of the place. The town owns its own electric-light plant and water-works system, and they are both free from debt. There are churches of all the principal denominations, some of them quite handsome and costly. There are three banks, each occupying its own building, and one of them has now in process of construction a fine brick structure. Each has a capital of $50,000, entirely held by local people. The last statements issued by these banks showed that they had aggregate deposits of $418,978.05, with aggregate surplus and undivided profits of $66,796.92. This is better evidence of the prosperity there than anything else. One of these banks is only a year old, yet it musters nearly $10,000 in surplus and undivided profits. Another unfailing sign of the up-to-date quality of the citizens of Crowley is the successful operation of two daily newspapers, two weeklies and a monthly. One of these little papers, the Signal, has a circulation, extending far beyond the confines of Acadia parish, greater than any State paper outside of New Orleans or Shreveport. While the dirt streets are well kept and afford good driving even in the worst weather, a movement is already on foot to pave the principal thoroughfare, and the pavement of other streets will follow. There is also talk of putting in an underground drainage and sewerage system, and that will in all likelihood be the next improvement undertaken. There is only one thing lacking in Crowley at the present time, and which makes its progress appear stunted to the stranger. That is a hotel commensurate with the needs and importance of the town. There are half a dozen small rookeries, and they are crowded all the time. Here is an excellent opportunity for the investment of $75,000 or $100,000, and if any moneyed men went into the project they would find the citizens of Crowley ready and willing to contribute their share to the enterprise, besides taking stock.

Apropos of this reference to opportunities, there is a splendid opportunity for investment in a paper mill here. It could get its raw material for little or nothing, and the only capital required would be for the construction and equipment of the plant. There are hundreds of thousands of tons of rice straw grown on these farms every year, and the problem of disposing of it is a worry to the farmers. Most of them burn it. It has been demonstrated that rice straw is admirably adapted to the making of paper, and an independent mill located in Crowley could make the paper trust feels its existence.

The location of the eight rice mills in Crowley is in accordance with the systematic plan governing everything about this model little town. They are all on the south side of the Southern Pacific Railroad track, located sufficiently far apart to prevent the danger of communicating fire from one to the other, yet they stand in line like a Brobdignagian Guard, their towering heights and smoking chimneys piercing the clear blue sky 100 feet above the seeming Lilliputian buildings around them. There is every safeguard against fire. Besides having each mill equipped with its own apparatus, some of them having the automatic sprinkling system, there is an immense water main running the entire length of the tract occupied by the mills, and it is tapped at each mill. There is a pressure in this main which will suffice to send the water almost to the top of the tallest of the mills.

The discovery of fuel oil at Beaumont relieves the manufacturer of a heavy expense in that section. The irrigation pumps all use oil, and they find it cheaper and better than wood, which they got for the cost of the cutting and hauling. The bright prospect for the early development of oil fields in the immediate vicinity of Crowley gives promise of still greater advantages. There are lands within twelve miles of Crowley (the Prairie Mamou fields) which have shown indications of oil pressure as great as that on Spindle Top, and which oil experts have pronounced greater and better than the Texas fields. Most of these lands are owned in Crowley, so that when the gushers are actually brought in, Crowley will be the central point of operations, because it is the largest town within a radius of fifty miles.

Twenty-five thousand Northern and Western people have been brought into Southwest Louisiana within the past fifteen years, and the annual immigration is increasing. There have been few, if any, failures among those who have come, and the stories of their prosperity have been heralded far and wide. It is confidently predicted that within the next two or three years there will not be an acre of land available within twenty miles of Crowley. At the present time there is comparatively little, and none in the immediate vicinity of the town.

If Longfellow could but return and take a glimpse of his "Beautiful Acadie," what a graphic picture of the strenuous life could be drawn on the background of his forest primeval, where fifty years ago he saw only the beauties of nature and languid love under the blue skies of an eternal Indian summer!

Will M. Stuto

A Strong Trust and Guarantee Company

The Title Guarantee & Trust Co. of Atlanta, Ga., was originally organized as a banking company in 1889 with a capital stock of $300,000. It transacted the business of a bank of deposit for a number of years. In 1899 it withdrew from the banking business and commenced actively the business of a trust company, also organizing a title department.

In preparing for the title business it had made complete abstracts of all instruments affecting title to real estate in Atlanta and Fulton county, which have been arranged according to the locality system. A number of the public record books have been lost, but copies had previously been made by a private company, and these copies have recently been purchased by the Title Guarantee & Trust Co., so that it now possesses the only complete copies of instruments affecting such title, which copies are not accessible to the general public. This department of the company is under the direct management of Mr. Felix Camp, a lawyer of ability and long practice, with years of experience in the specialty of examining and passing upon title to real estate. He has under him an ample corps of assistants trained in the business, and including several other lawyers with special knowledge of and experience in the law of real estate. The company in this department enjoys a practical monopoly of the real-estate title business of Atlanta and Fulton county.

The company also conducts a real-estate mortgage-loan department, negotiating mortgage loans on approved real-estate security. This department has been conducted for a number of years with such signal success that no investor in one of these mortgages has lost a single dollar, though of the mortgages negotiated by it there are now outstanding upwards of $3,000,000. It has also constructed a safe-deposit vault recognized as one of the safest and strongest in the South, absolutely fireproof and as nearly burglar-proof as money and skill can make it.

The company transacts a regular trust-company business, acting as trustee, transfer and fiscal agent for corporations and as trustee, administrator and executor for individuals and estates. Its capital is $500,000, and in addition to this, under its charter the stockholders are liable to creditors in a like amount, making a total responsibility to its patrons of $1,000,000, besides surplus and undivided profits of $60,000 at present. The responsibility and protection thus afforded is larger than any trust company south of Richmond. It also possesses the very best connections in New York, Boston and the East, and its facilities for the transaction of a trust business are unequaled in the South. It has been connected with a number of organizations and reorganizations of magnitude. Among the most recent ones may be mentioned the organization and financing of the Tipton, Thomasville & Gulf Railway Co., the Union Lumber Co., the Birmingham Railway, Light & Power Co., the Athens Electric Railway Co., the Georgia Electric Light Co., the Atlanta Rapid Transit Co., the Empire Building, Atlanta, Ga., and is now engaged in the consolidation and financing of all the street-railway and electric-light properties of Atlanta and vicinity. Its officers and directors are well known in financial circles and deserve and enjoy the entire confidence of the public.

The officers of the company are: H. M. Atkinson, president; P. S. Arkwright, vice-president; T. C. Erwin, second vice-president; S. J. Bradley, cashier; Felix Camp, manager title department; Clem Gazzam, manager real-estate department; directors, H. M. Atkinson, W. H. Inman, P. S. Arkwright, Morris Brandon, F. C. Block, T. B. Paine, T. C. Erwin.

SOUTHERN PINES' PLEASURES.

Delights of the New Resort in North Carolina.

Among the enterprises of the South well worthy of note is the establishment of a new resort at Southern Pines, N. C. It was the genius of a native North Carolinian, Mr. J. T. Patrick, chief industrial agent of the Seaboard Air Line, that originated the project, and where a few years ago there stood a pine forest in its virgin, uncultivated state, today a thriving village stands. Originally designated as a health resort where invalids might go, today it is better described as a pleasure resort, and thousands find their way to Southern Pines every year. The mild,

beautiful climate is so attractive that those who go for pleasure are delighted, while those who go for health are benefited so quickly and the balm-laden air is so beneficial that many of both these classes erect cottages and make Southern Pines their permanent residence.

A thriving, pretty little village of 1000 inhabitants is the result of all this work. The largest hotel at this place is Piney Woods Inn, a most charming, homelike hostelry under the management of Mr. Charles St. John. Every year it is filled to overflowing, and the guests are unstinted in their praises of the management of this up-to-date winter resort. It is a good place to go to, and those of our readers in need of rest and recreation should write for booklet.

INVESTIGATE PADUCAH.

Splendid Advantages Offered by This Prosperous and Rapidly Growing Kentucky City.

Paducah is located in the heart of the great Ohio-Mississippi valley, right in the center of the greatest domestic market in America, and with special advantages for reaching the Southern, Texas and Southwestern markets. Paducah has four great navigable rivers. These rivers, the Ohio, Cumberland, Tennessee and Mississippi, regulate railroad charges and give our city the lowest transportation charges possible.

Paducah has great natural resources in the way of raw timber, and especially the desirable hardwoods. No better place can be found for furniture and kindred factories and dimension stock factories. The Paducah iron district is on the eve of great development, and special advantages exist here for the manufacture of pig-iron, steel, wire and nails, stoves, etc. We especially desire correspondence with parties contemplating the location of factories in these lines.

We want a wagon factory and a buggy factory. The timber is here, and our facilities for distribution are such that wagons and buggies can be made here and laid down at the desired markets at the very minimum cost. We have two very successful textile plants, but have the labor for more.

The finest clays for tableware and the finest glass sand is found near Paducah, and can be put here at a very low cost. Address the Paducah Commercial Association.

John H. Kirby:
A TEXAN WORKING FOR TEXAS

The opportunities presented to capable men in Texas are so numerous and varied as to make enumeration a difficult task.

Nature has been especially generous to this State, which is so large in area as to embrace among its resources every product of the temperate zone.

The people of Texas are proud of their State, proud of its history, proud of its citizenship, but prouder than all else that it has been and is the home by birth or adoption of its great percentage of successful, self-made men.

Texas has grown with marvelous rapidity, and with this advance have come opportunities beyond the end of counting, but in every instance Texas had the men who were equal to the occasion.

The past in Texas has made a grand record, but the best times this State ever saw are the present, while the future is so rich with certainty as to make other sections of the world tame, uninteresting and uninviting.

Every acre in Texas is worth more today than it was last year, and will be worth more next year than it is now. The great Lone Star State is today the cynosure of capitalists and homeseekers alike, and to the active, capable, self-reliant young men of America there is no other field so full of promise as Texas. The indolent, easy-going, go-as-you-please fellows had better stay at home, for they are moving to the tune of a lively quickstep down in Texas; soft places for drones and idlers are stored away in the pawn shops, and the last twenty years have grown many green country boys into great big men.

Illustrative of their careers, and demonstrating their possibilities in this young giant among the sisterhood of States, is John H. Kirby of Houston. This most talked about of all Texans is today but little past forty-one years of age. He was born on a Tyler county (Texas) farm, November 16, 1860. The county was then a wilderness, and the war and reconstruction in which this baby grew to strong and sturdy boyhood as the youngest of seven children lacked much of being promising.

It is useless to go over his boyhood days in which he learned to work and then to read. At nineteen he got a year in school. Every extra dollar bought a book, and he became a country school teacher. And he was a good teacher. He saved his meagre earnings, bought more books, exchanged with others and read everything he could lay his hands on. He got a place in the tax collector's office, and no other money he has ever made since has been so much appreciated as this, for it allowed him to attend the Southwestern University at Georgetown, Texas, for one term.

The young men of this type had no lyceums or lectures to attend, no libraries to visit. Churches and schools were rare. It was the frontier in all that the word implies, except that there was no outlawry. The citizenship was good, pure and strong.

The influences that surrounded young Kirby at home were the best. His father and mother, who still make their home on a Tyler county farm, were of that sort which a son can look up to with pride, no matter to what height he may climb.

Hon. S. Bronson Cooper, then State senator, but now and for several terms representing the Beaumont district in the House of Representatives at Washington, gave young Kirby access to his law library, and he read at nights and whenever at leisure in the daytime. Through the aid of Mr. Cooper he secured an office in the Texas Senate during the sessions of 1882, 1883 and 1884. He married Miss Lelia Stewart of Woodville, Texas, in 1883, and became a member of the Woodville bar in 1885. Col. R. M. Johnston, editor of the Houston Post, tells the following to illustrate the character of the man:

"Some years ago, while at the State Capitol, I was approached by a friend who was a candidate for a legislative position, and who solicited my aid. During the course of conversation we discussed his competitors in the race, and after going over the merits, and possibly the demerits, of those gentlemen, we both convinced ourselves that my friend stood a splendid chance of election. As we were about to separate I asked my friend if he had no other opponent. 'No,' said he. 'There is a young fellow from East Texas in the race, but he don't amount to anything.' 'Who is he?' I inquired. 'Oh, well, he's a piney-woods scrub from over about Woodville named Kirby,' was the answer. When the votes were counted the 'piney-woods scrub' had more than all three of his opponents. He had gotten there. And this same young man has been getting there ever since. He acquired the habit early in life, and it has stuck to him."

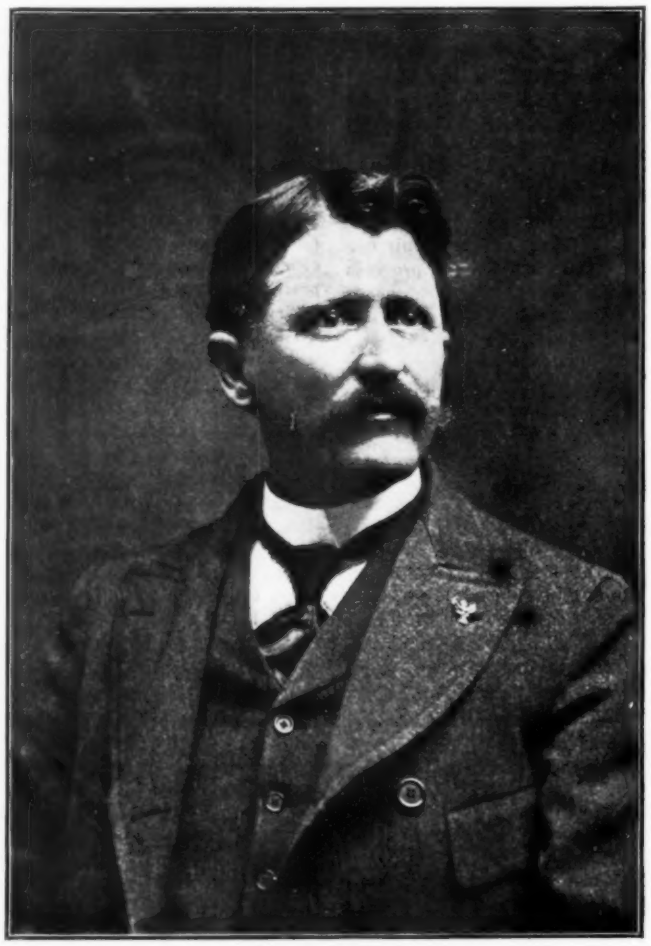
Becoming engaged in a land case brought Mr. Kirby in touch with some Boston capitalists, and this marked the turning-point in his very successful career.

Through this connection he interested Boston investors and organized in 1886 the Texas & Louisiana Land & Lumber Co., of which he assumed the management. The purpose of this company was to manufacture timber and to purchase and sell timber lands.

Following this was the organization of the Texas Pine Land Association, of which Mr. Kirby became general manager.

At the age of thirty his interests had grown to such large proportions and were so varied that he found it advisable, and, in fact, necessary, to make his headquarters in Houston.

From that date to the present his career has been much the most interesting in Texas, and when the reader remembers that it covers some of the bluest times the United States ever experienced, he cannot but admire the courage of the man who never faltered, never flinched, but constantly added to his holdings of pine lands. During this time he built the Gulf, Beaumont & Kansas City Railroad, known locally as the Kirby road, which covers the richest and best long-leaf yellow-pine timber belt in the world. This road is now a part of the Atchison, Topeka & Santa Fe Railway system, and it was sold at a handsome profit to Mr. Kirby and his associates. His success came under difficulties, and his career has been compared to that of Hon. Tom Johnson, Cleveland's famous mayor. The men are alike in many respects.



JOHN H. KIRBY.

John H. Kirby is true to his friends, and his friends have been true to him. His Eastern associates had confidence in him and his enterprises, and they stood by him to a man, meeting all payments and accepting additional holdings as he bought them, for he never sold pine lands once acquired.

The man had a purpose. It was to become the owner of the best pine lands of America. These lands are worth from five to twenty times more than he paid for them, and he and his associates hold this great asset today as the foundation upon which the Kirby Lumber Co. is to become one of the most substantial and successful commercial organization in this country.

Bear in mind the time. Do you remember how things looked from 1893 to 1896? Were you in business then? Why, you couldn't give lumber away. There was no use for it. Thousands of people had concluded that the world had too many houses, and it would be years before any more would be built. There were ships lying idly at the ports, and the shipyards were empty. Pine lands were not worth taxes; but Kirby kept on buying; buying when they thought they had him broke; buying when the banks were refusing to lend money on government bonds; buying when the old railroad systems were watching and waiting like a cat watches a mouse to gobble up John H. Kirby and his railroad and timber lands. But somehow or other they could never swallow the dose.

A newspaper correspondent would get a tip at Galveston from a railroad authority that one railroad magnet had control of Kirby's interest. The next we would hear about this would be a dispatch under a New York date line. Probably something would originate in Boston; then it would come Houston's turn; then an Austin correspondent would take a turn at it; in fact, the whole ultra-conservative element had made up their minds that Kirby could not win out and among men who were considered good judges of the value of properties, Texas pine lands were let loose at from $3 to $8 per acre, and while they all had Kirby broke, it would turn out that Kirby got that land.

If there is any one thing more than another to which this man owes his great success beyond his genius as an organizer, it is the frank, straightforward and truthful way in which he presents all matters in which he has an interest.

Mr. Kirby is today the executive head of many substantial enterprises. The mention of a few must suffice. He is president of the Planters and Mechanics' National Bank of Houston, president of the First National Bank of Austin, president of the Southwestern Oil Co., with refinery at Houston and fully-equipped stations at all important points in the Southwest.

He is president of the Kirby Lumber Co. of Houston, with $10,000,000 capital, and the mills of this company have an annual capacity of 400,000,000 feet, making the Kirby Lumber Co. the largest single producer of long-leaf yellow pine in the world. This company is his chief pride, and a full-page advertisement of it appears in this issue of the Manufacturers' Record.

Probably the greatest compliment ever paid a citizen of this country was the great industrial banquet tendered to Mr. John H. Kirby by the city of Houston and the State of Texas at the Rice Hotel, Houston, Tuesday, November 12, 1901. The occasion was the return of Mr. Kirby from New York, where he had successfully financed the Kirby Lumber Co. with a capital of $10,000,000. The event was to celebrate the industrial awakening in Texas, and probably no occasion in the history of the South or the country has been given so much attention by the press. The Southern Industrial and Lumber Review of Houston issued a 36-page supplement, every line of which was devoted to a report of this banquet. Among the speakers from a distance were Mr. John E. Williams, editor Lumber Trade Journal, New Orleans; Mr. Richard H. Edmonds, editor Manufacturers' Record, Baltimore; Mr. J. E. Defebaugh, editor American Lumberman, Chicago; Hon. C. A. Fellows, ex-mayor Topeka, Kan.; Mr.

Jas. A. Davis, industrial commissioner Santa Fe system, Chicago; Mr. W. E. Barnes, editor St. Louis Lumberman, St. Louis. In addition to these, there were responses from some of the best-known men in Texas. There were between 300 and 400 of the prominent citizens of Texas, Louisiana and other States around this banquet board, and whatever honors may be conferred upon Mr. Kirby in the brilliant career that is mapped out for him there will be no occasion which he will remember with greater happiness and satisfaction than this unparalleled and unequaled banquet, which came as a surprise party and was arranged in every detail without his having any knowledge of it until the morning preceding the banquet.

Within the past few weeks Hon. Joseph D. Sayers, governor of Texas, has appointed about sixty of the most enterprising and progressive citizens of Texas as commissioners to take charge of an exhibit of the resources and products of the Lone Star State at the Louisiana Purchase Centennial Exposition, to be given at St. Louis in 1903. This commission has chosen Mr. John H. Kirby as president, and out of all the numerous public honors which have been offered him during the last few years this is the only one he has accepted, and it is the belief with the people who know him best that, in connection with other active spirits who will co-operate with him, Texas will be well represented at St. Louis.

His live interest in all that pertains to the development of Texas has been frequently shown in his many acts for the State and for individuals, the spirit of which is revealed all through the following pen picture of him:

"John H. Kirby is, first of all, a pronounced individuality, a forceful personality and most intensely a character.

"Original in thought, careful in plan, he lays a foundation upon which to carry a project to a successful issue, and his dash and daring in execution, which have been so much commented upon and in some instances adversely criticised by nervous conservatives, is only shown after his guns are placed and his game sighted.

"He is always natural; he never poses or plays to the grandstand. He is convinced that there is more force in a smile than a frown, and he would rather illustrate a point through an apt story than a set speech.

"He has the happy faculty of being a manager without becoming a boss; he does not lose his dignity in conferring with his lieutenants, although he frequently acts upon their advice. His workmen know him and respect him, and their loyalty to his interests is born of the fact that none are so humble as to seek his advice and assistance without a hearing.

"He puts his whole heart and brain into a business transaction, and goes at a funny story with exactly the same force.

"He is mentally and physically sound and healthy. He has never learned the meaning of jealousy, and spite is foreign to his nature. Beyond and above everything, he is a Texan, true and loyal to his nativity. He doesn't know how to beg, and he neither courts nor deserts a fight. It would be superfluous to call him a leader—he was born that way. Kirby is like Caesar—veni, vidi, vici."

Texas: A Land of Promise

WITH THE COMPLIMENTS OF THE KIRBY LUMBER COMPANY

The State of Texas today offers possibly the best field for the investment of brawn and capital of any State of the growing South.

This statement is not based upon any predilection for Texas particularly from a sentimental point of view, but is made with a due and correct consideration of actual facts in a general comparison made between Texas and her sisters east and north.

The phenomenal growth in population and values alone is sufficient justification for the assertion were it not made absolutely so by the wonderful resources and facilities for expansion existing within the limits of a territory whose people claim, with pride, to be an empire.

Time will soon be when Texas will have wrested this title from the populous and wealthy Eastern State on the Atlantic seaboard, for although New York is the center of the moneyed interests and a gateway to all the country west, yet Texas will one day be the Empire State in point of population, agricultural development and enterprise.

It is in Texas the agriculturist shall have full play. Texas will always be an agricultural State, no matter how magnificent be the future development of her mineral resources and the elaboration of manufacturing enterprises.

This is due to a series of conditions maintained by extent and climate, and these conditions make it possible for the farmer to grow in perfection any of the prime crops grown in the United States, and grow them all in abundance. It becomes to the prospective settler merely a question of what he desires to grow. Be he agriculturist, horticulturist, viticulturist, simple farmer or scientific experimentalist, the choice is with himself—Texas opens her glorious territory, and the settler is satisfied with the prospect.

It seems like a stupendous proposition to say to the outside world "Texas has everything, is everything, and will be everything," and yet 'tis true. It is the only State beneath the flag of liberty that could safely isolate itself from the remainder of the world and subsist on its own production and wax fat on an abundance.

Possessing every advantage offered by its sister States north, east, south and west, it actually contains also every element of human necessity, with a few tropical exceptions to prove the assertion. Wheat, cotton, sugar, rice, oats and corn produce abundantly, and, with the exception of the first-named, which is confined to Northern Texas, all may be successfully cultivated in the same field, to say nothing of the various other products which form man's daily provender.

The area of Texas is 265,780 square miles.

Its population is 3,048,710, an increase of 36.4 per cent. since 1890.

It contains 243 counties, all but fourteen of which have participated in the general increase, Harris county, in which is Houston, showing the greatest increase in numbers, with a percentage of 71.2, due to the rapid growth of that city.

Of the 170,499,200 acres, less than 15,000,000 are in cultivation by upwards of 300,000 farmers. This immense area is larger than six Pennsylvanias, while Connecticut, Rhode Island, Delaware and District of Columbia would not distend the limits of Pecos county alone. England, Scotland and Ireland would not half cover the State, which could also contain Italy and Switzerland without any serious crowding.

Texas became a part of the Union by the voice of its people, who surrendered nothing but an honest allegiance, retaining a magnificent domain, which is destined to make the Commonwealth great and its people prosperous.

Plain statistics are perhaps the most intelligible, and while figures may be distorted to provide for almost any condition, the following represent the latest compilation showing the production of prime crops and farm values, with certain comparisons which may not be considered invidious:

Cotton for 1899-1900—Acreage, 6,642,309; product, 2,438,555 bales; value, $92,187,133. For 1900-1901—Acreage, 7,040,848; product, 3,500,000 bales; value, $157,500,000.

Cottonseed—Tons, 1,500,000; value in oil and by-products, $20,450,000.

Hay, 1900—304,933 acres, 548,879 tons, value $3,752,377.

Potatoes, 1900—14,789 acres, 916,918 bushels, value $806,888.

Oats, 1900—744,164 acres, 28,278,232 bushels, value $8,438,470.

Wheat, 1900—1,271,517 acres, 23,395,913 bushels, value $14,973,384.

Corn, 1900—4,553,495 acres, 81,962,210 bushels, value $38,522,568.

Barley, 1900—2049 acres, 50,405 bushels, value $36,292.

Rye, 1900—3917 acres, 64,630 bushels, value $43,302.

Rice, 1900—100,000 acres, 1,000,000 barrels, value $3,500,000.

Total acreage, 14,035,712; total value of products, $245,298,681.

Estimated acreage in fruit, vegetables, sugar-cane, tobacco, etc., 1,000,000; total value of products, $25,000,000.

Total acreage, 15,035,712; total valuation, $270,298,681.

Texas leads all other States in the Union in number of head and total value of beef cattle, including all except milch cows. In 1900 they numbered 4,887,795, and were valued at $85,510,022.

This makes Texas own one-sixth of the total number in the United States, worth one-ninth of the valuation. The estimated value of beef cattle marketed was $30,000,000.

Milch cows in 1900 numbered 763,173, and were valued at $19,270,127. The average value per head in Texas was $25.25. The average value per head in the United States was $31.60.

The estimated value of milk and butter consumed at home and marketed was $18,732,338.

The total value of all cattle in the year 1901 was $104,780,149, and of their products, $48,732,338.

The total value of swine for 1901, 2,418,032 head, was $11,256,020.

There were marketed and consumed at home 804,508, valued at $6,838,318.

In 1900 the sheep numbered 2,657,393 head, valued at $5,097,469; the production of wool 7,972,179 pounds, valued at $1,195,826; mutton valued at $1,972,179; a total annual production of $3,168,005.

Texas ranks seventh in the United States in point of number of sheep.

The horses to January 1, 1901, numbered 1,238,209 head, valued at $25,858,147, and the mules numbered 286,618 head, valued at $10,082,645, a total of 1,524,827, valued at $35,940,792.

Texas leads every State in the United States in number of animals, but is below the average in value per animal. Texas has one-twelfth of all the horses and one-eighth of all the mules in the United States.

	Number.	Value.
Cattle	4,887,795	$85,510,022
Milch cows	763,173	19,270,127
Swine	2,418,032	11,256,020
Sheep	2,657,393	5,097,469
Horses	1,238,209	25,858,147
Mules	286,618	10,082,645
Total	12,251,220	$157,074,430

The total annual production, 1900, $58,732,338, sold and consumed does not include horses and mules.

These figures point to a very strong lesson. Texas ranks highest in number of farm animals, producing more cattle and horses than any other State, i. e.: One-sixth of all the cattle in the United States, one-eighth of all the mules, one-twelfth of all the horses, one-eighteenth of all the hogs, one-nineteenth of all the sheep, and one-twentieth of all the milch cows.

The average value per animal is less than the average value in the United States:

	Texas.	U. S.	Highest State.
Cattle	$17 86	$24 97	$33 47
Mules	35 18	53 56	84 18
Horses	20 88	44 61	86 37
Hogs	4 40	4 40	.....
Sheep	1 92	2 93	4 55
Milch cows	25 25	31 60	40 55

Texas is undoubtedly adapted to the production of farm animals, and by improving the quality so as to bring the average value up to the United States average it would add the great amount of more than $72,000,000 to the total value, and increase the value of what is marketed each year by $25,000,000.

This is one-twelfth of the total wealth produced on the farms of the United States for 1900, and a magnificent showing. It is nearly $100 for each man, woman and child in the State, while the average for the United States is less than $50 per capita, and only about one acre in ten in cultivation.

Quoting from Judge Z. S. Fulmore's article on the "Growth of Texas," the fact is at once apparent that the State has accomplished marvels in progression, and that the full extent of this progress had not been adequately realized by the people of Texas, much less by the remainder of the nation.

The matter compiled considers the period which expired with 1900, and much condensation was necessary, in view of the subjects touched upon. The figures, however, will prove interesting and instructive to any student of economy, as well as to the reader who seeks proper and correct information concerning a State which at one time was conspicuous only for its long-horned steers, its bad men and its heroic history. Judge Fulmore says, among other things:

"The State started out in 1870 with a population of 818,579, an increase of 36.47 per cent. over 1860. In 1880 the population was 1,594,749, an actual increase in numbers of 773,170, the ratio in numbers being 94 per cent.; in 1890, 2,235,523, an actual increase of 640,874, or 40 per cent.; in 1900, 3,042,828, an increase of 807,305, or 30 per cent., the number of the last increase being only about 11,000 less than the entire population of 1870, and the largest in the State's history.

"The ratio of increase in population for the thirty years ending in 1900 has been 274 per cent. The growth of other important factors in our progress has been much greater. For example:

"In cotton production the increase has been 800 per cent.

"In corn production the increase has been 425 per cent.

"In wheat production the increase has been 3754 per cent.

"In oats production the increase has been 2653 per cent.

"In taxable values the increase has been 430 per cent.

"In railway mileage the increase has been 1323 per cent.

"The cotton product of 1870 was 350,628 bales, or about one-ninth of the total crop of the United States—3,011,906 bales; of 1880, 805,184 bales, or about one-seventh of the total crop—5,755,359 bales; of 1890, 1,471,511 bales, or about one-fifth of the total crop. In 1894 the product reached 3,154,000 bales, or about one-third of the total crop, and since that date has

alternated around the 3,000,000 mark, and this may be estimated as the crop of 1900. The increase in Texas has been over six times as great as in the balance of the country.

"The large increase in 1894 was followed by a corresponding decrease in price, which arrested progress in cotton culture and turned attention to other crops, so that the corn crop, which was 69,112,150 bushels in 1890, reached 107,905,565 bushels in 1895. This, in turn, was followed by a corresponding increase in the hog product, which went from 2,252,476 in 1890 to 3,035,119 in 1895, ranking the State in 1895 and 1896 fourth among the great hog-producing States of the Union.

"Railroads have displayed such a conspicuous and necessary part in the development of the State, and are such a reliable guide to our increase in wealth, as to justify their being ranked as one of the most important factors. The largest increase in railway mileage in the history of the State during any four years was between 1880 and 1884, when there was a correspondingly large increase in values.

"That increase was from 3224 miles in 1880 to 6198 miles in 1884, and in taxable values from $311,470,736 to $693,060,917, or an increase during the four years of 92 and 93 per cent., respectively.

"In 1870 the total railway mileage of the State was 711 miles, or one mile to every 1151 inhabitants and 373 4-5 square miles of area; in 1880, 3224 miles, or one mile to every 439 inhabitants and 82 4-5 square miles of area; in 1890, 7810 miles, or one mile to every 256 inhabitants and 30 1-5 square miles of area; in 1900, 10,024 miles, or one mile to every 300 inhabitants and 26 2-5 square miles of area.

"There are twenty-five counties of the State, extending from Travis to Grayson, intersected by the Houston & Texas Central and the Missouri, Kansas & Texas railways, with an aggregated area of 22,626 square miles, or 14,480,640 acres, about one-twelfth of the State's area, capable of producing as much cotton, corn, wheat and oats as is now produced in the entire State. As far back as 1894 one of them produced 120,470 bales of cotton, 2,311,626 bushels of corn, 582,271 bushels of oats, 69,398 bushels of wheat, 56,647 bushels of sweet potatoes, 5777 bushels of Irish potatoes, 2513 tons of millet, 6723 tons of hay, besides the other crops. The total value of these products at present prices is $7,098,444.75. The county's area is 969 square miles, and the population in 1890, 31,174, one-fifth of which was urban. This crop was produced on less than two-fifths of the county's area.

"Without consuming the space to itemize, the value of the products of this county exceeds by nearly $500,000 the entire cotton, corn, wheat, oats, sweet potatoes, Irish potatoes, hay, rice, sugar, molasses and sorghum crop of the State of Florida, to produce which required an expenditure for fertilizers of $857,327. This group of counties produced 657,989 bales of the 1,471,279-bale crop of 1890, and more than 49 per cent. of the 3,154,000-bale crop of 1894.

"If the value of our farm products increases within 25 per cent. of the ratio of increase during this decade, and prices are maintained at anything like the ruling prices of 1900, the values of 1910 will reach $400,000,000. If all the cotton mills now in operation in the United States shall double their capacity during the next ten years, they will not be able to manufacture the Texas product. More than half of all the wheat, one-fourth of all of the corn, four-fifths of the beef, one-third of the mutton and pork, three-fourths of all the horses and mules must find outside markets.

"Without this, such products as potatoes and peaches must continue to be consumed or wasted at home.

"There are no waterways to the sea, and unless Congress comes to the rescue the transportation of this immense mass of product must devolve wholly upon the railroads and their exportation upon the facilities afforded by a single seaport."

It will be seen from the foregoing that much has been accomplished, and that development has advanced with wonderful strides.

The greatest allurement to the prospective settler, however, rests within the scope of possibility, for, in contemplating the opportunity and natural advantages, the average mind becomes bewildered.

There are fully 4,000,000 acres of land capable of being put into rice cultivation. The product of 1,000,000 acres alone will place $35,000,000 into circulation, and this will be realized within the next five years at the present ratio of increase, and yet it is a new industry for Texas. In rice, the barren prairie lands of the great coastal plains have found their redemption, the cereal rescuing them from the reign of the steer and making them ten times more productive.

The new industry will be the means of settling the waste places in South Texas with intelligent and thrifty farmers, the remarkable ease of cultivation and harvest proving too attractive to be disregarded, while the great element of profit in raising the cereal renders it a star in the agricultural firmament. That one man can cultivate 100 acres and realize $25 per acre net reads almost like a romance. Yet it is fact.

There is sufficient arable land to double the present output of cotton, and yet cotton last season gave the farmers over $150,000,000 for their labor and faith. The present contention between the cotton-grower and the Mexican boll weevil, however, bids fair to reduce acreage, and it is probable the rich bottom lands may be put into sugar-cane unless Congress takes the Cuban growers under its wing and cuts the profit with the duty.

Texas contains possibly the richest sugar lands in the United States. The fertile alluvial basins which follow the Brazos, Colorado, Old Caney, Trinity and Guadalupe rivers offer magnificent inducement in the direction indicated. Matagorda and Wharton counties contain sufficient alluvial land to grow fully 200,000,000 pounds of sugar. These counties years ago were considered the most productive sections of the South, and were in part cultivation before the Civil War stopped operations by constricting the facilities for shipments.

The industry at present is reviving under the stimulus of new blood, energy and brawn in the State, and the next few years will witness a wonderful development in the territory mentioned as the splendid opportunities are realized and taken advantage of. Fine sugar lands may be secured at prices ranging from $20 to $40 per acre.

The fame of the southwestern coast sections is rapidly spreading in the great world of garden trucking. The territory in the so-called semi-arid sections south of San Antonio, about Corpus Christi, Beeville and Victoria, has been proven; it is known to be a verdant paradise for the purpose referred to, and the shipments of early vegetables are yearly increasing. A simple system of irrigation by artesian wells is partly in vogue, and the results have been surprising.

Corpus Christi alone last year shipped $100,000 worth of cabbage. A single acre at Beeville produced cauliflower in the value of $900. A single acre of onions near Brownsville produced $1200. The black soil near San Antonio, when irrigated, nets to intelligent thrift from $250 to $600 per acre. Alvin, south of Houston, last year shipped small fruits, including strawberries, to the value of $86,680. When it is remembered that the seasons in the territory mentioned are far in advance of other sections in the South, it may be understood how considerable are the sources for profit therein, the populous centers of the West affording constant markets for all products.

There is no limit to the possibilities in connection with fruit-growing. Any part of the great State is adapted to the successful cultivation of certain fruits, chiefly peaches, plums, apricots, prunes, persimmons, nectarines, grapes and pears. The deep black lands near Denison, in North Texas, the cheap, cut-over, red-pine lands of Central East Texas, the valleys of West Texas, and the basin of the Rio Grande alike offer extraordinary inducements to the prospector.

East Texas represents the greatest development along this line, the shipments from Jacksonville and other points in the same neighborhood running yearly into thousands of carloads, with constantly increasing production. These lands may be secured at prices ranging from $2 to $5 per acre in quantities to suit.

As an illustration of the development of the vegetable and small fruit industry, it may be interesting to note the following: During the year 1901 twenty-four towns in Texas shipped 895 cars strawberries, 2835 cars canteloupes, 1072 cars tomatoes, 1232 cars potatoes, 1140 cars cabbage, 162 cars cucumbers, 2810 cars peaches, 470 cars pears, 226 cars vegetables. This was a total of 10,842 carloads from a few sections mentioned, the entire lot of shipments leaving the State.

The end of the fiscal year 1901 showed the resources of all national banks in Texas to be over $135,000,000. From June, 1900, 104 national banks were instituted, with a paid-in capital of $4,500,000. This condition points to a prosperous people, and in this connection it may not be amiss to mention that the cotton crop of 1900-1901 put $150,000,000 into the pockets of the farmers, and that this, added to the prolific crops generally, gave the rural sections almost a plethora of wealth. This resulted in increased bank earnings and a vast volume of business, as every farmer "painted his barn and bought a new buggy."

The vast area of Texas may easily be subdivided into agricultural sections or divisions, if only for the purposes of illustration, a simple process being only necessary.

North Texas, north and west of a line drawn through Dallas and Fort Worth, represents practically the area restricted to wheat, although it produces abundantly in the valleys of the mountains north of San Antonio. Here also is grown corn, oats, rye and barley, and potatoes.

Central and South Texas, south of Dallas and Fort Worth, and including the greater part of the arable land in cultivation, may be called the cotton belt, the area being only restricted to the early frost line on the north. Here is also cultivated corn, oats, hay, potatoes.

South Texas, south of a line east and west through Houston, is the rich rice and sugar belt, one of the most productive sections of the State. In addition to these products, oats, cotton, corn, early garden truck, berries, watermelons, figs, oranges and tender vegetation thrive splendidly. South Texas, also known as the coast country, is within the rain belt, the average rainfall being between fifty and sixty inches per annum.

East Texas, east of a line drawn north and south through Houston, marks the extent of the great long-leaf-pine territory, which pushes like a wedge southward to the Gulf of Mexico. Here are to be found the fine fruit lands. Cotton is exteusively cultivated, and hemp and tobacco thrive with every element of prospective profit. Vast deposits of soft red hematite iron ore are yet lying idle near Nacogdoches.

West Texas, west of a line drawn north and south through San Antonio, is the semi-arid region of the State, and contains a vast territory in which agriculture is impossible except in specially-favored localities, the want of an adequate and reliable rainfall being the chief obstacle to success in this direction. In this magnificent domain, however, are many of the immense cattle ranches which contribute so markedly to the wealth of the State. The climatic peculiarities are such that cattle thrive the year round, the rains in the summer as a rule providing provender for the remainder of the season.

It is in Western Texas, where the plains roll into mountain ranges, that the State has reason to anticipate its mineral development.

No prospecting has been done with any precision or degree of system, yet indications point to the existence of the minerals which are common to the Rocky mountains, which subside gradually in the territory mentioned. The celebrated cinnabar or quicksilver deposits of Brewster county and the wonderful silver mines of Shafter and Noyes, in Presidio county, are isolated illustrations of what rewards await the man with the hammer and crucible.

In the neighborhood of Llano, west of Austin some ninety-five miles, are to be found an infinite variety of minerals and natural ornamental building stone. Gold, copper, silver, asbestos, talc and graphite are among the number, and here, too, is located the largest deposit of black magnetic iron ore in the South. The supply is inexhaustible, and has not been drawn upon, owing to the lack of available coal supply. The ore-beds permeate the entire section and resemble greatly the celebrated iron ore of Cuba.

Vast deposits of gray and red granites, capable of receiving high polish, are located near Llano, and splendid serpentine marbles, the handsomest building material in the world, are in abundance. The quarry interests are yet in their infancy, and bid fair to exceed in supply and wealth the most celebrated deposits of a like kind in the United States. The State Capitol at Austin and the tremendous jetty works at Galveston were constructed of the red granite taken from "Granite mountain," near Llano, and yet the immense bulk removed scarcely scars the deposit.

The subject of port facilities could be stretched "ad infinitum," but the mass of statistics so adduced would convey little to the average reader.

Galveston, the chief Texas port, during the fiscal year ending June, 1901, exported products to the value of $101,857,000. During the year 1899 Galveston was the leading port of the United States in cotton exports, as shown by the following figures, in bales: Galveston, 1,997,867; New Orleans, 1,916,439; New York, 657,354; Savannah, 625,557; Boston, 405,415. No other port reached a total of 400,000 bales.

In exports of grain Galveston was only surpassed by one port in the United States, viz., New York. The total amount of grain exported from Galveston in 1899 was 20,020,514 bushels, as against 16,055,618 in 1898. In 1899 Galveston exported 15,073,674 bushels of wheat and 6,946,840 bushels of corn.

The total value of the foreign trade of Galveston during 1899 amounted to—imports, $2,163,087.96; exports, $71,559,375.80; total, $73,722,463.76.

Exports of cottonseed meal increased from 229,085 tons in 1898 to 253,815 tons

in 1899. Exports of cottonseed oil increased from 5,372,124 gallons in 1898 to 6,501,051 gallons in 1899. During 1899, in spite of a short cotton crop, the registered tonnage cleared was 1,135,766 tons, as against 1,080,724 tons in 1898, accounted for by the increase in the movement of grain through that port.

The foreign vessels entered comprised 294 British, 44 Norwegian, 24 Spanish, 19 German and 10 Danish; total, 391. United States coastwise vessels increased in tonnage cleared from 264,176 tons to 334,738.

The combined exports of the other Texas ports will probably foot up approximately $25,000,000.

The Texas "fuel-oil" fields, as they are frequently termed, represent one of the most remarkable phases of nature's vagaries. Man's research has given to man a material which is destined to revolutionize existing methods and place a lever in the hands of the manufacturer which must force the State to a position its facilities and advantages demand.

Cheap fuel is the base upon which the world revolves. It makes possible the conversion of raw products and enables the artisan and capitalist alike to demonstrate the possibilities contained in nature's storehouse. In its possession, Texas is at once placed to the front and enabled to compete with the great coal States, and at the same time to offer inducements to idle money in the rich Eastern and Middle States to invest in the recently-opened territory.

The Beaumont oil fields have exceeded in promise the known oil territory of the entire world, not excluding the Baku district by the Caspian Sea, which was, up to the hour the Lucas gusher burst upon the horizon, one of the wonders of the universe. Discovered January 10, 1900, the Beaumont oil field has developed so rapidly that today it is capable of supplying the entire demand for the commodity in this country, and has attracted the attention of capital the world over.

To date 141 wells have been bored and driven on Spindle Top, each a marvel in its way, each capable of spouting a six or eight-inch stream of the greasy fluid 150 feet into the air, and each with a daily capacity of from 20,000 to 50,000 barrels, equalling, individually, the combined output of 10,000 wells in the Pennsylvania oil fields.

The absolute craze which followed the "bringing in" of the Lucas well rapidly forced values to a top notch.

The shipments of oil to date figure 1,633,202 barrels. There are in storage 2,500,000 barrels, 1,000,000 barrels estimated waste, or a total output of over 5,000,000 barrels since the industry was set upon its feet.

Over $7,000,000 has been expended in actual operations.

Total capitalization exceeds $300,000,000.

Nearly $20,000,000 has been spent in purchase of oil stock.

Over 140 miles of six and eight-inch pipe have been used in the wells and pipe lines.

The capacity of the field today is estimated at 50,000,000 barrels annually, based upon the present pressure and output of the wells, only a few of which are employed in active operations. Other territory has been proven in East Texas, and the prospects for a material addition to the known field are flattering.

The annual production of yellow pine in the State of Texas approximates 1,200,000,000 feet. The output ten years since was in the neighborhood of 300,000,000 feet.

It is estimated that there is standing in East Texas at the present time some 20,000,000,000 feet of yellow pine, covering 2,000,000 acres.

The capital invested in the lumber interest of Texas is estimated at $25,000,000.

There are in the State 100 saw-mills having a daily capacity of 50,000 feet, and 200 smaller mills with a capacity averaging 10,000 each per day.

Sixty per cent. of the Texas output is consumed by the railroads within the State; 20 per cent. is sold to the general markets in the State, and the remaining 20 per cent. going beyond its limits.

The consumption of lumber by the Southern Pacific, using this as an illustration, averages $4 per minute, and of this enormous amount, not less than $1,000,000 is expended annually in the renewal of crossties.

A few facts, in conclusion, may be of interest. Texas controls 38,000,000 acres applied to the support of the educational system. Over 15,000 teachers occupy desks in the public schools. Its permanent free-school fund is represented in State bonds, $2,183,100; county bonds, $3,915,556.60; railroad bonds, $1,603,317; municipal bonds, $91,547.55; land notes, $13,101,330.78; estimated value lands, $20,613,527; total, $42,817,730.53.

The State's taxable values increased from $170,473,778 in 1870 to $981,701,848 in 1901, and its railroad mileage from 771 to 10,153, with 934 miles now in course of construction.

Just at present a determined effort is being made to attract settlers into the State. The immigration bureau of the Southern Pacific and several of the other lines are assiduously working to that end by means of immigration agencies and literature. The trend is chiefly into the coast country, or South Texas, and the response to the efforts described are generous. The prospects are that within the next five years the population of the State, by the means mentioned, will be increased by not less than a million souls. Texas is in the public eye, and her magnificent resources, opportunities for investment and natural advantages combine to create a field superior to any other section of this country.

The immense school fund of the State, backed by "one-half the public domain," creating a fund equalling $64,000,000, is not the least attraction to the resident of other States.

Possessing the greatest railroad mileage of any State in the Union, several splendid ports, millions of fertile vacant acres, low land values, and producing more in proportion, from an agricultural standpoint, than her competitors north, east, south and west, Texas has a magnificent destiny, glorious in the extreme, and one which shall mark the pages of American history in letters of gold.

H. M. MAYO.

SUBSTANTIAL FORT WORTH.

The Texan City Well Equipped for Healthy Growth.

The history of Fort Worth is unique among the cities of Texas. Established as a military post soon after the Mexican War, because of the beauty and healthfulness of the locality, it has held its position for prominence, ofttimes under adverse circumstances, and in spite of many obstacles, from that time to the present.

It came into notice as a possible railway point in 1872, but only secured its first road in 1876. Since then every day has shown some material advance in business. At no time has it had a meteoric progress, but at all times it has shown a steady and substantial growth in business and population.

It is the natural mart for the products and supplies of an area larger than all the Middle States of the Union, which is without a peer in point of fertility of soil, variety of products and geniality of climate. Blessed with facilities for transportation unsurpassed in the Southwest, it is prepared to handle the immense volume of business which the fertile section tributary to its gates provides.

It now has eight railway systems and thirteen outlets, radiating in every direction, and during the first half of the present year these systems and outlets will be increased by two. All of these are trunk lines extending entirely across the State, and through adjoining States to the principal commercial marts of the country.

The principal sources of business are agriculture, railway and cattle industry. It is conceded to be the center of the cattle business, the second largest interest in the State. The marketable product of the 9,000,000 cattle raised in Texas have always paid tribute to Fort Worth. The establishment of the two packing-houses of Armour & Co. and Swift & Co., the two largest concerns in this line in the world, will give a new impetus to this business. Work has already begun on these, and they will be pushed to completion in time for the early fall trade, adding thousands to the population of the city and millions to its annual business. It has been the history of all packing-house cities that they have become the most important commercial points in the region of their location, and the same results are anticipated for Fort Worth.

The manufacturing industries of Fort Worth are not commensurate with its advantages as a distributing point, but this interest is increasing daily, and at no distant day it will be the leading manufacturing city in this section. It now has about 200 manufacturing plants of more or less importance, involving capital of about $3,000,000, with a product of over $6,000,000 annually. Flour from its mills finds a ready market throughout the country, and solid trainloads are sent to the seaboard for European markets.

Its financial institutions are sound and conservative, and have abundant capital to meet commercial demands. Capital is needed for permanent improvements and the establishment of factories, building houses and otherwise developing the city, and it will in all instances, judiciously invested, bring sure and satisfactory returns.

Among other evidences of the solidity of the place is the fact that the public improvements are of substantial and enduring character. The Texas & Pacific Railway has erected at the south end of Main street the most commodious and handsome pasenger station in any town of 40,000 people in the world, and is expending hundreds of thousands enlarging its yards and otherwise improving its facilities for handling its growing business. At the other end of Main street stands the handsomest courthouse in the United States, built of Texas granite. The City Hall, fire stations, school buildings, government buildings and churches are all substantial and modern structures. It has the finest water-works plant in the South, the most comprehensive sewer system, more miles of improved streets and better public improvements than other cities of its size.

Fort Worth is the headquarters of the Eleventh Division of the Railway Mail Service, located here by reason of its unexceptional railway facilities.

In fact, Fort Worth is an up-to-date city in every respect, and prospective homeseekers and persons contemplating a change of location for personal or business reasons will do well to look at Fort Worth before locating elsewhere.

ADVANTAGES OF DALLAS.

Opportunities There for the Manufacturer and Investor.

Dallas, Texas, though yet a young city, has 60,000 population, and is growing rapidly. Last year's building record, when 892 building permits were issued, valued at $2,450,000, nearly doubled that of 1900, and yet there are no vacant houses, the demand keeping ahead of the supply. Dallas presents striking advantages as a manufacturing center, there now being here over 180 separate institutions, all growing and prosperous. With bituminous coal fifty miles west and fuel oil near by, cheap fuel is assured. Experts have declared that Dallas can produce cheaper iron and steel than Chicago, Pittsburg or Birmingham, because the ore and lime are nearer Dallas, while charcoal can be produced cheaply in exhaustible quantities. Soft ores are found in abundance within 120 miles, and the highest grades of hard ores within 150 miles, while the ores of Llano, 350 miles away, are said to have no superior in the world.

Dallas is nearer the Gulf than Birmingham, and the Trinity river, made navigable to the sea, would give superior shipping facilities. Abundant and accessible raw material make feasible the manufacture of furniture, terra-cotta, pottery, glassware, paints, cement, etc.

Dallas has now six railroad systems, with two others building, radiating in eleven directions. Sixty passenger trains arrive and depart daily. The shipments of merchandise and general freight are far ahead of any other city in Texas. Dallas is the center of the most productive and thickly-settled area of Texas. The annual wholesale business exceeds $40,000,000. It is the leading city of the United States in the manufacture of cotton-gin machinery and harness and saddlery goods, and has the largest saddlery house in the world. It is the largest market in the world for agricultural implements and machinery, the trade in this line reaching $15,000,000 annually.

Fire and life insurance headquarters for the State are located in Dallas, and all the State and general agents here do a large business with Louisiana, Arkansas, Oklahoma and Indian Territory.

Dallas has four national banks, with $10,000,000 deposits, and the annual clearances are over $160,000,000.

The city has no floating debt. The bonded debt is $1,920,000, less $225,000 sinking fund. Assessed values are $23,984,000. The city owns property valued at $2,903,143, and its water-works alone would sell for more than enough to pay its entire debt. Dallas 4 per cent. bonds sell at par. The tax-rate is $1.50 per $100. The public schools are equal to any in the country, and other educational facilities are ample.

The Texas State Fair, held in Dallas annually, is the largest of its kind in the United States. The attendance last year was 273,428.

There is no city in the Southwest whose prospects look brighter or which is growing more substantially and steadily than Dallas. It is a good field for the manufacturer and investor to investigate Its population is very cosmopolitan, and strangers are always welcome.

The Dallas Commercial Club will furnish any information desired.

What Oil Did for Beaumont in One Year

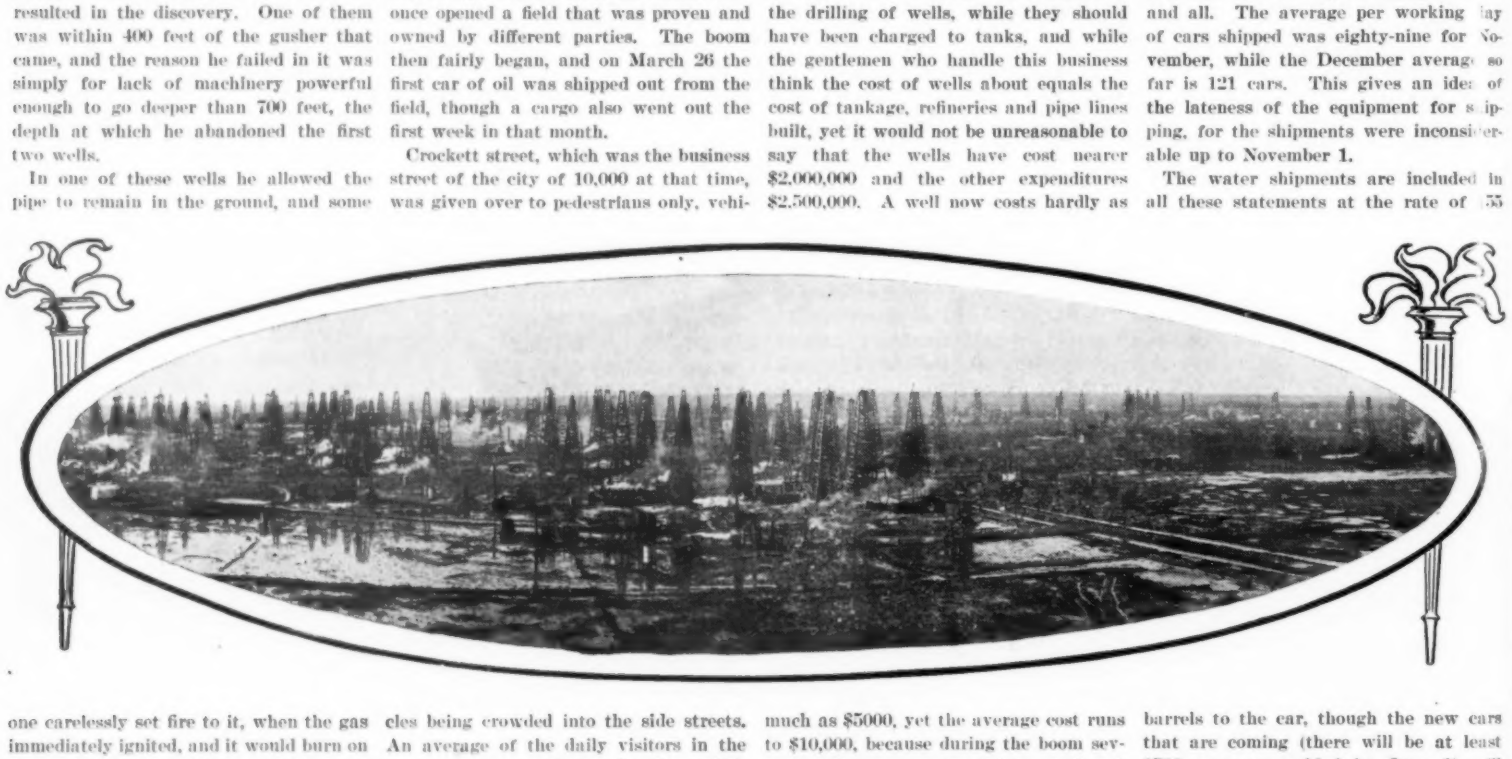
By F. W. GREER

The great Lucas gusher was first made known to the world on January 10 as a phenomenal oil well, the like of which has never been seen in America. This has now been a year ago, and the results of this well have been of such a character as to justify the reproduction at length of a few of the things that followed the belching forth of the oil geyser from depths unknown, and with a force that not even the scientists who have given years to the study could explain.

Capt. A. F. Lucas, a mining engineer from Washington, D. C., is the gentleman who gets the credit for this wonderful discovery, and yet it required two years of "wildcatting" on his part before anything came of his efforts.

He bored two wells prior to the one that resulted in the discovery. One of them was within 400 feet of the gusher that came, and the reason he failed in it was simply for lack of machinery powerful enough to go deeper than 700 feet, the depth at which he abandoned the first two wells.

In one of these wells he allowed the pipe to remain in the ground, and some



one carelessly set fire to it, when the gas immediately ignited, and it would burn on for an indefinite period, or until put out by smothering.

This was not the first "wildcatting" on this spot, for eight years ago Patillo Higgins organized what is known as the Gladys City Oil, Gas & Manufacturing Co., which is still in existence as one of the best companies operating here, and their efforts resulted in boring a well with machinery that was not strong nor powerful enough to go deeper than 400 feet. They also abandoned their efforts for the time, and Mr. Higgins then sought to secure outside capital to bore and develop the spot, which he all along felt possessed a world of wealth greater than Alaska or any other place of similar proportions on the face of the earth. Mr. Higgins never gave up, and was finally the medium through which Captain Lucas was induced to come here and bore for oil on Spindle Top Heights. The result was a well after the third attempt producing 70,000 barrels of oil per day and running with such force as to prove beyond question its practical inexhaustibility. The oil spouted in a continuous stream 160 feet in the air.

The people of Beaumont were themselves quick to realize the advantages of this discovery, and the result is that Beaumont men have been the ones who made the most money from the oil development. They immediately began securing lands on the Hill in advance of the outsiders, who rushed in, and by May, when the great oil boom was at its height, there were already in Beaumont at least three men who were worth more than $10,000,000, while there were several millionaires, and men of wealth running into the hundred of thousands were not uncommon. They were nearly all Beaumonters before the strike came.

Until the Beaty well came in, March 26, there was a tone of uncertainty to it all, because many thought the field would be limited to a few feet, and all this was in the possession of Captain Lucas and his associates, Col. J. M. Guffey and John H. Galey, both of Pennsylvania. The Beaty well, however, relieved this feeling, and being 1700 feet from the Lucas, it at once opened a field that was proven and owned by different parties. The boom then fairly began, and on March 26 the first car of oil was shipped out from the field, though a cargo also went out the first week in that month.

Crockett street, which was the business street of the city of 10,000 at that time, was given over to pedestrians only, vehicles being crowded into the side streets. An average of the daily visitors in the city was conservatively placed at 4000. They would come from Houston, Port Arthur, Orange and Sabine Pass, where they would spend the nights and would trade in lands here all day. They would make a trade on a goods box or in a drawing-room of a private residence or in some lawyer's office. A piece of property would jump in a single day from $10 to $100 per acre, and so on. This applied to lands all over the county, and the disease inflicted itself upon the neighboring counties as well.

All of this has now passed, and Beaumont today, with 20,000 people, has an air of business and thoroughness in everything. The oil field that is proven shows a space of a little over 200 acres, and covers what they call the Hill. It is in reality only a gradual elevation, imperceptible unless the visitor's attention be called to it, and yet the oil seems to lie under the elevation only.

As to the number of wells bored: There have been now bored to completion or abandonment in this county 206. Of these, 130 are on the Hill, and are gushers. Four are at Sour Lake, twenty miles from the gusher lands, and they have shown signs of oil, and will be developed, though the quicksand has so far rendered developments impracticable. The remaining number, seventy-nine, are "dusters" or "dry holes," being all nonproductive and scattered through the county over a radius of twenty miles.

This development has required an investment of $2,250,000 in the drilling of the wells alone, while the tankage and pipe lines have now run this up to past $4,500,000, though it is admitted that many claim a valuation in expenditures here for oil purposes only of from $5,000,000 to $7,000,000. The writer regards this as an exaggeration after a full discussion with the leading pipe and iron selling houses here and talks with the officials of the leading producing companies. It is entirely safe to estimate the refineries and pipe lines and tankage at $2,250,000 additional, and in doing this the drayage and common labor bills have in a good many instances been charged to the drilling of wells, while they should have been charged to tanks, and while the gentlemen who handle this business think the cost of wells about equals the cost of tankage, refineries and pipe lines built, yet it would not be unreasonable to say that the wells have cost nearer $2,000,000 and the other expenditures $2,500,000. A well now costs hardly as much as $5000, yet the average cost runs to $10,000, because during the boom several wells were contracted for and cost complete as high as $22,000. This was exorbitant, but was a fact, nevertheless, and the high cost was due to the anxiety of the various companies to get gushers with dispatch. This made a scarcity of men and material, and the contractors raised the prices accordingly.

There are now three pipe lines running to Port Arthur and Sabine Pass, both of which points are deep-water ports, and can accommodate any ordinary-sized ship that travels the ocean. The tankage will accommodate 2,500,000 barrels as it stands today, and this is being constantly added to. By June 1, 1902, there will be, at the lowest calculation, tankage for storing 5,000,000 barrels of oil from the Beaumont fields, and the bulk of this tankage is of the iron-covered, above-ground kind, and it may be said that these are the most expensive of all tanks used in the oil business.

The close of December business will run the total amount of oil taken from the Spindle Top field to 4,520,885 barrels. This includes the oil actually shipped, which has been 1,017,885 barrels; the amount now in tanks and unshipped, 2,400,000 barrels, and the amount estimated to have been wasted by the Lucas well when it ran wild for ten days, and the Palestine-Beaumont well, which ran wild for four days, amounting to 1,053,000 barrels, which also includes the small amount wasted with the bringing in of each well. This enormous production of 4,500,000 barrels has been accomplished within eleven months, for these figures are based on the results up to the first of December rather than the present time.

These shipments of something over 1,000,000 barrels were made with a limited shipping equipment, so far as the railroads are concerned, for there were on December 1 only 1350 cars in the service, and the shipments of November alone were nearly one-half the total, shipments prior to that time being 2227 cars, all told, for that month. December will run above 3000 cars as a total, or more than 100 for each day, including Sundays and all. The average per working day of cars shipped was eighty-nine for November, while the December average so far is 121 cars. This gives an idea of the lateness of the equipment for shipping, for the shipments were inconsiderable up to November 1.

The water shipments are included in all these statements at the rate of 55 barrels to the car, though the new cars that are coming (there will be at least 1500 new cars added by June 1) will average per car at least 225 barrels. The daily shipments will, therefore, average by that time something over 250, with a total tonnage per day of 7750. This will more than equal the cotton and wheat-crop tonnage of America, and yet the industry will have been less than a year and a-half old.

The first oil sold was at the rate of forty cents per barrel, but it afterwards came down in jumps until it is stated on good authority that some contracts were actually made at the rate of three cents per barrel. The prices were based at the mouth of the well, and the buyer standing all expense. The price now is about twenty cents, and the oil will safely average eighteen cents per barrel on board the cars.

There is one completed refinery at Port Arthur for handling the Beaumont production. It will handle 10,000 barrels per day, and the capacity is being doubled. There is another refinery under construction a few miles north of Port Arthur, and about fifteen miles from here, that will also have a very large capacity, while there are two refineries to be started here in January, and one is already under course of construction in Orange county for handling Beaumont oil.

The oil produces illuminating oil, gasoline and all other products of the Penn-

sylvania and Ohio oil fields, and is regarded as their equal in quality, while, of course, the immense volume of the supply takes the price out of all proportion to the prices obtained for those fields' production.

The first well showed a pressure of 105 pounds to the inch. This was a four-inch opening from the supply. Another well gave a pressure in April of 107 pounds, while a 10-inch well in the November just past gave the phenomenal pressure on the gauge of 348 pounds to the square inch. The cause for the large pressure in this case is attributed to the larger size of the hole, but it shows conclusively that with 4,500,000 barrels taken from the great reservoir, or whatever it may be, there is apparently no diminution, and consequently the supply has hardly been tapped even. All the other wells show the same pressure now that they did at first.

As a result of the oil boom and the already healthy conditions of the city in a business way, there are now in course of construction here, by actual statistics taken from the city government books, more than $1,000,000 worth of business brick buildings and $300,000 in other buildings, mostly residences.

The city was regarded as in excellent condition before the oil strike, it having increased its population 186 per cent. from 1890 to 1900, jumping from something over 3000 in 1890 to 9427 in June, 1900. These are the figures of the United States census. The population is now placed at 20,000. This is regarded as conservative, there being frequent claims of 25,000 for the present population.

Rice was first grown for marketing in Southeast Texas in 1884, but the idea was practically abandoned at that time, and it was not taken up actively again until 1895, when the rice farmers of Louisiana began to overflow into Texas and stopped first at Beaumont and then Orange, and along further to the west. It will therefore be seen that with this industry Beaumont is almost new, it having been demonstrated in the season of 1895 for the first time that Jefferson county possessed rice land of as excellent quality as any in the world. In this advantage the county is not alone, there being along the coast strip of South Texas twenty-one counties that have in them from ten to 100,000 acres of as fine rice lands as can be found, and this idea is being demonstrated daily, and a party of wealthy gentlemen are right today at Brownsville, the extreme border land with Mexico, in search of cheap lands, which they propose to utilize by placing under cultivation for rice. The lands that far down can be bought for $2.50 per acre, and it is hard to find buyers at that figure.

Rice can be cultivated in nearly any kind of soil, but the requisite for the rice farmer is that the land be level. It is raised with water more than any other crop or cereal in the country, and it requires land that can be made by artificial means into lakes of water. Small levees are thrown up and run along, subdividing each strip usually into about ten acres. These little levees are not over two feet in height, and the ground is by this means inundated with fresh water after the plant has just sprouted out and above the ground. Land along running streams is, therefore, most desirable, though artesian wells are used in a great many cases, and with success. The water is pumped on the land where the plant is growing, so that the top of it just peeps above the water until it is well advanced. The pumps are kept constantly going for a month usually in order to keep this up. The water is left off then, and the plant is about ready to begin maturing.

The above is the art of rice-planting in brief, though there are some particular things to be observed with which the writer is not familiar. It can be said, however, that rice is the easiest of all cereals produced, and the only objection that can be urged to rice farming is the fact that it requires more than ordinary capital to start into it. When the farmer is once started he is fixed for his remaining days. The lands in Jefferson county range in value from $10 to $50 per acre, while, of course, there are some that cannot be bought at any price, because they are exceptionally good and are not on the market.

There are several large irrigation companies in Jefferson county in which there are amounts invested ranging from $25,000 to $500,000. The Beaumont Irrigation Co., one of the first to organize, was capitalized at $150,000, and has been earning on the capital since its first year the enormous profit of 41 per cent. per annum. This is not exceptional, either, every company in the field having experienced similar successes.

The whole county is practically prairie lands, and being absolutely level, it is, therefore, easy to irrigate. The above-named company runs one of its canals a distance of twelve miles from its base of supply and waters more than 100,000 acres of lands when necessary.

In Beaumont there are three large rice mills with a capacity of 4100 barrels combined. In other words, they can mill that much rice in twenty-four hours under ordinary conditions. They operate their plants day and night for about six months of the year, and during the remainder of the time are, of course, idle. This is Beaumont's only industry that goes by seasons, her remaining advantages being all possessed with the year-in-year-out faculty, the lumber mills being notable instances of this.

In these rice mills there is an aggregate investment of $300,000 in the plants and their auxiliary properties, all of them owning outlying warehouses in which to accommodate their custom in the way of storage. The cleaned rice is exported to Cuba and all the West Indias and Mexico, while it is sent to every point in the interior. The local mills have made shipments this season already to Portland, Ore., and to Augusta, Me., to say nothing of large consignments to the central interior.

One of these mills has been here four years, but the two younger ones were only put in just in time for last season's crop, and are new for Beaumont.

There are in Houston and Galveston each one mill, but they are smaller than the Beaumont mills, this being a sort of central location for the agricultural pursuit of which so little is as yet known.

It is hard to give an adequate idea of the amount of the investment in this county alone in the rice-growing branch of its numerous avocations, but it would not be far to state that the lands under cultivation aggregate in value $3,500,000, while the milling properties, including the wealth that goes with them, but which was not included in mentioning the plants above, will run the total up to $500,000, making a grand total investment for rice purposes of $4,000,000.

The taxable values of Jefferson county are, as reported by the State officials, something over $10,000,000, and the actual values will, of course, run more than treble that figure at the present time, since the $10,000,000 valuation was made before the oil discoveries, and were normal for the first of January, 1901, and not this year. It is upon this basis that the actual investment in the rice culture is placed at $4,000,000.

It is appropriate in the discussion of rice and oil with Beaumont's history that lumber come in for its share.

Without the great lumber manufacturing interests that find a home in Beaumont the very city itself would today be a little village, for lumber was the first great advantage that Beaumont came into the possession of, and this was begun here thirty years ago.

First a little ancient saw-mill, owned by Seale & Smyth, was erected, and the Long Manufacturing Co., the Beaumont Lumber Co., the Texas Tram & Lumber Co. came along in succession as the city became more prominent, and to the officials of these large institutions more than to any other set of individuals Beaumont owes a debt of gratitude for her present marvelous growth.

The present capacity of the Beaumont mills is close to 80,000,000 feet per annum, there being two single circular mills and one band and circular mill combined. These mills were, up to the first of the year, the property of the Texas Tram & Lumber Co., the Reliance Lumber Co. and the Beaumont Lumber Co., but on that date they passed into the hands of the Kirby Lumber Co., along with others.

The properties that changed hands with these three companies alone was in the aggregate $4,000,000, and when this money came into Beaumont on January 1 it ran the total deposits of the Beaumont banks up to the very large figure $6,400,000, making the deposits here surpass any city in the State, and that distinction has remained with Beaumont since that time, and it is thought that it will remain so for a long time to come. Houston has something over $5,000,000 on deposit, and that is, perhaps, the nearest city to Beaumont in point of money on hand.

There is a peculiar thing in connection with Beaumont's lumber interests, and that is that it is, perhaps, the largest producing center; at least, it is the largest when the ownership is considered, and the property given to the place where the man who owns it lives, in the State. By this is meant that with the three Kirby mills here and the lumber companies who own mills and do the banking business here and turn their profits into Beaumont only, the city is by far the largest manufacturing center for lumber in the South, and yet it is also the largest in point of local consumption.

As the city's lumber interests now stand, there are here the three large Kirby mills alluded to above, and also the J. F. Keith Co., the Yellow Pine Tie & Lumber Co. and the Cow Creek Tram Co., which are Beaumont firms to a less or greater extent, and all of which have been purchased by the Kirby Lumber Co. Then, in addition to these, there are the Bartholomew Lumber Co., the Forrest Lumber Co., the United Lumber & Export Co., the Wm. Cameron Co. (branch office, with Beaumont as its tie headquarters), the Sabine Tram Co., the Industrial Lumber Co. and the Nona Mills Co., Limited.

The concerns enumerated above, yet not under the control of the Kirby Lumber Co., are the representatives of about $900,000 actual incorporated capital, while, of course, the Cameron Company runs into the millions as to valuation, and has its interests scattered over Texas and Louisiana.

The Bartholomew Lumber Co. is now constructing a hardwood band mill in the south end of the city that will have a capacity of 60,000 feet, board measure, per day, while the Forrest Lumber Co. in the north end will run to about 30,000, giving Beaumont a total daily capacity for lumber of 450,000 feet actually manufactured at Beaumont, while the companies with domiciles here manufacture daily, or have a daily capacity rather, for they do not average this much, of 910,000 feet.

There are in Beaumont four banks, each with a capitalization of $100,000, and on December 31, 1901, their combined deposits reached the enormous total of $6,011,815.99, against less than $1,000,000 for a year ago. These figures are given because they are phenomenal, and are greater than those of any city in Texas at the present time, regardless of population. They also show in a marked degree the great wealth that exists at Beaumont.

A Market for Cotton-Mill Securities.

The establishment of a regular market for cotton-mill securities is a much-needed advance in Southern financial operations. Bonds and stocks, especially preferred stocks, of Southern cotton-mill properties can be safely considered investment securities offering a much larger return than the usual run of issues of this class. The percentage of failures or of loss in investment in cotton-mill securities in the South is much less than in the average run of investment bonds and stocks dealt in on the leading stock exchanges of the country. For many years dealings in cotton-mill securities were limited to local demands, and changes of ownership or the offering of additional issues were often difficult by reason of the fact that in no community had the regular trading in cotton-mill securities been established on the same basis of operation as in railroad securities. No significance would be attached to an order placed in New York or Baltimore to buy or sell stocks or bonds of railroad, gas or trolley companies, yet when a corporation or an individual sought to do the same with cotton-mill securities in the South the transaction was often attended with some difficulty, and could not be handled in the same businesslike way as elsewhere. The development of the cotton-mill business of the South is bringing about a change, and a very necessary one. With such a vast capital as that now invested in the cotton-manufacturing interests of this section, it has become necessary for the best interests of cotton mills, as well as of the stockholders in cotton mills, to develop both at home and abroad a regular market for trading in these securities.

Messrs. Hugh MacRae & Co., Bankers, of Wilmington, N. C., have been instrumental in taking an active part in the organization of a regular market throughout the country for such securities. They have kept in close touch with the conditions affecting values, and are able to furnish current quotations on all leading cotton-mill securities of the South. Mr. Hugh MacRae of this firm is president of the Wilmington Cotton Mills and is an expert upon mill properties. Recently, in referring to this phase of the changing conditions which have been brought about in cotton-mill investments, he stated that his firm could now place at least $1,000,000 in gilt-edged 7 per cent. securities, mainly in the preferred stocks of Southern cotton mills. This offers an unusually attractive opportunity for investors seeking a first-class security with a larger interest rate than can be obtained in most investments nowadays. This house also figures in other enterprises besides cotton mills, a recent important deal which it carried out having been the purchase of the Wilmington Seacoast Railroad and the reconstruction of the line as a trolley road.

The Southern Pacific's Work in Developing the Southwest

It has long since become a certainty that the railroads generally exert a potent influence upon the fortunes and prospects of both individuals and institutions. History has been made and repeated by the great lines of communication which now ramify the entire country, and although railroad building and institution has practically been responsible for the prosperous condition existing in the United States, and in the rapid settlement of its vast areas, Texas particularly may be pointed to as evidencing the fact that railroads can make States prosperous as well as exerting a beneficial influence upon the fortunes and prospects of the individual.

The Sunset-Central lines, which permeate the richest and most extensive portion of the State of Texas, exemplify this statement, as, where natural conditions have been in any way favorable, the country lying along or contiguous to these lines has developed to a condition of prosperity which could only have been possible by the elaboration and institution of these available channels of trade and transportation.

The Houston & Texas Central Railroad, which is the direct line of communication between North, Central and Southern Texas, taps every large city in the State with the exception of San Antonio. Nearly every acre of land contiguous to this road is covered with great crops, possible only in a State of such vast extent as Texas. The northern quarter of the line traverses the most beautiful portion of the South, equal in beauty and natural fertility to the famed Blue Ridge section of Kentucky. From Denison to Dallas the line operates through one of the most prolific wheat sections of the country, and in this same territory are grown vast quantities of corn, while fields of cotton intersect the acres of the two cereals mentioned. From Dallas to Houston, on the main line; from Bremond to Waco, on the Waco branch; from Hempstead to Austin, on the Austin division, and from Garrett to Fort Worth, on the Fort Worth & New Orleans division, the eye falls on interminable fields, in which a million bales of cotton are annually picked.

Farming, fruit-growing and fine stock-raising in these sections have reached a high stage of cultivation, and are rapidly forcing taxable values ahead and contributing materially to the constantly-increasing wealth of the State.

The country in and about Llano, on the Austin & Northwestern division of the Houston & Texas Central, is also destined to play an important part in the development of Texas. The vast aggregation of mineral wealth and building stones lying almost idle must of necessity result in the introduction of outside capital and a rapid increase of action and enterprise in the Llano district. The minerals are all adapted for commercial use, and will pay the developer well for his energy.

Possibly the most important deposit in the section referred to is the magnetic iron ore, which is said to be the finest Bessemer-steel ore in the United States. The deposits are inexhaustible, the question of cheap and available fuel alone to be considered in their elaboration. The mineral closely resembles the celebrated Cuban ore, which now plays a considerable part in the great American iron industry. Copper, gold, silver, asbestos, graphite and numerous less important minerals are more or less evident, all in sufficient quantity to fully justify working and shipping. Splendid varieties of talc exist, and the granites, both red and black, exceed in quantity and quality the most noted quarries of the East and Southeast.

The celebrated "Granite mountain" at Marble Falls was quarried to furnish the material for the Capitol building at Austin and the magnificent jetties in Galveston harbor. Daily shipments are being made to all parts of the country, the rock taking a fine polish and being quarried in blocks of any size desired.

The celebrated "serpentine" marbles also exist in great deposits, supplying the most ornamental building and finishing material found in the entire United States.

The Houston & Texas Central Railroad, with its several divisions, has been in operation for nearly half a century, and in that time has witnessed the growth of Texas until it has reached its present wonderful proportions. The equipment of this railroad is second to none in the South. It has a fine ballasted roadbed and heavy steel rails, while its rolling stock, both freight and passenger, represents the very best effort of mechanical building. Its trains are operated in order to serve the best interests of its patrons, and as a result of intelligent effort on the part of its officers, it is pointed to by the people of the State as an example which other roads might do well to follow. It operates through sleeping-car lines to all important Texas cities out of Houston and Galveston, and to St. Louis, Denver and Chicago.

The Southern Pacific, Sunset Route, which has its eastern inception at New Orleans, operates through the great sugar bowl of Louisiana and the wonderful rice and oil belt of that State and Texas. It is in connection with the two latter industries that the business world has marveled much, and progress has set its seal upon the coast sections of the two States.

The rapid conversion of the prairie lands of Southwest Louisiana and the coast country of Texas into fertile sources of wealth means the reclamation of hitherto unproductive areas which had been given over to the reign of the beef steer.

Already, and the industry is but little more than ten years old, has the cultivation of highland or prairie rice revolutionized the commercial aspects of the cereal in the United States and practically dominated the domestic markets. Three hundred and fifty thousand acres are now in actual cultivation in the two States, and the crop of the past season put over $10,000,000 into circulation among the rice growers and irrigators.

Irrigating canals now mark the rice territory in great profusion. Over 600 miles of these miniature waterways, with 1000 miles of lateral ditches, give abundant testimony of the growth of the industry. The greater number of the rice farmers being skilled agriculturists from the Middle West, it follows that enterprise and thrift are factors in a production of 486,000,000 pounds of rough rice, or 300,000,000 pounds of rice as it is supplied to the consumer.

The very large element of profit, nearly $25 per acre, is proving very attractive to prospective settlers, and they are journeying into the rice areas in constantly-augmenting numbers, securing holdings and embarking in a venture the wisdom and virtue of which a moderate posterity can vouch for.

The remarkable development of mineral oil, or "fuel oil," at Beaumont, Texas, has violated all precedent and established a record peculiarly it own. The history of the wonderful spouting oil wells at the location named and at Sour Lake, Texas, and Jennings, La., has become trite, in view of the manner in which it has constantly been exploited by the press of the world, and little advertisement of it is therefore needed here. The fact that the development of the oil, as well as that of the rice industry, follows the route of the Southern Pacific, however, is sufficient excuse for this mention. It offers splendid possibilities for the location of idle capital in the erection of manufacturing enterprises to which a cheap and plentiful fuel would be a desideratum. The opportunities in this regard are illimitable, and the gradual conversion of coal-burning plants into consumers of oil testifies to the appreciation of the people generally and a realization of the great benefit which must result from the Beaumont discovery.

Irrigation is also being practiced in the more western parts of Texas and applied to the cultivation of early garden truck. The territory tributary to the Sunset lines about Beeville, Victoria, Cuero and Corpus Christi has achieved considerable reputation in the growing and shipping of vegetables, and the large element of profit entering into the industry has created considerable comment. Recent investigations and experiments at San Antonio have demonstrated that by irrigation land can be made to yield two crops and over $600 per acre. The possibilities in this connection offered by the country contiguous to the Southern Pacific are infinite, and open to the man who but seeks, and then applies earnest labor and enterprise to what nature has already furnished.

Traversing an area 1194 miles in extent from New Orleans to El Paso, the Atlantic system of the Southern Pacific points a lesson to mankind exemplified in a variety of ways. Leaving the Sabine river, or "State line," east of Orange, Texas, the route follows the line of greatest development. It passes the sugar, rice and lumber of Southwest Louisiana, and it curves through the oil territory and rice areas of Texas, the one succeeding the other until the celebrated "coast country" and San Antonio is reached, and then on through the great cattle sections, the remarkable health plateau of West Texas. The Sunset Route, which for many years has handled the great bulk of its through California freights by steamer to New Orleans, thence by rail to 'Frisco, recently instituted very extensive improvements at the city of Galveston, the great Texas seaport, which even the fearful storm of September 8, 1900, failed to materially injure, from a shipping standpoint. These improvements were inaugurated by Mr. C. P. Huntington, who some years before his death conceived the idea of handling much of the Texas and Western freights through this port. Galveston is thus assured of a magnificent enterprise, which must contribute not alone to the development of that seaport, but to the prosperity of the city itself.

Galveston, by reason of its location and facilities, is bound to become an important gateway for the material handled by the Sunset Route, and when it is taken into consideration that an entirely new fleet of magnificent steamships has been constructed, the importance of the movement may be appreciated and realized.

The Sunset Route offers, in connection with the Houston & Texas Central, a first-class service from the Southeast to New Orleans into North, Central, East and West Texas. It is the great transcontinental line to the Pacific coast, City of Mexico, and all New Mexico and Arizona points. The track is rock-ballasted from one terminal to the other, a distance of 2500 miles. In connection with its steamer line from New York to New Orleans and Galveston, the Sunset Route offers unexcelled advantages for the handling of freight to all points in the trans-Mississippi country. Its passenger accommodations are first-class in every respect, and contemplated additions will bring its equipment up to the highest stage of perfection.

The celebrated Sunset Limited will operate this season three times a week. As an advertisement alone this splendid equipment has been the means of calling attention of thousands of persons to the advantages of Louisiana and Texas, and its increasing efficiency and additional attractions will augment everything that has been accomplished in this direction.

Free chair cars are being operated on all trains; wide box vestibules characterize all passenger equipment; magnificent dining-cars will shortly be made a feature of the through daily trains, and heavy steel rails are rapidly making the track up to date in every respect, the new ballasting and widening of the embankment making the route second to none in the entire country.

The Sunset Route is now building through Beaumont and Rockland to Dallas. It has extended its line from Wharton into the Caney Valley country, opening up what will eventually become a great sugar-producing country, and assisting in the development of the wide rice areas of Wharton and Matagorda counties in Texas.

Fifteen millions of dollars are being expended in improvements generally, and, these consummated, the Southern Pacific, Sunset Route, will tower, figuratively, head and shoulders above any of its competitors.

Its magnificent excursion sleeping-car service from Washington, Chicago, Cincinnati, Louisville, Atlanta, St. Louis, Minneapolis and New Orleans, through without change to all points in Louisiana, Texas, Arizona, New Mexico, Old Mexico and California, has attained a reputation commensurate with its advantages.

The Havana (Cuba) steamer service out of New Orleans offers a delightful opportunity to make a winter cruise, forty-eight hours from port to port, on the splendid new ships Chalmette and Excelsior.

Literature covering all the features mentioned may be secured by addressing any Southern Pacific agent, or by applying to—

S. F. B. MORSE, P. T. Mgr.,
M. L. ROBBINS, G. P. & T. A.,
T. J. ANDERSON, A. G. P. A.,
Houston, Texas.
F. S. DECKER, A. G. P. A.,
New Orleans, La.

Interesting Origins of Galveston's Greatness

The founder of uniquely cosmopolitan Galveston was Col. Michel B. Menard. He was thoroughly identified with the colonization of Texas and with its struggle for independence, and upon the organization of the Republic of Texas he applied to its first Congress in 1836 for a quit-claim deed to land on the eastern end of Galveston Island. He had purchased the head right to the same from Juan N. Seguin in 1834. Congress granted Colonel Menard's request in consideration of his payment of $50,000, and he at once took possession and organized the Galveston City Company, which elected him president. The land was surveyed and platted, and the first lot was sold on April 20, 1838. It was at the northeast corner of Strand and Tremont streets, now occupied by the J. S. Brown Hardware Co., and was sold for $3100. Exemplifying the character of its founders, the city was laid out on a broad and liberal scale.

All streets are eighty feet in width except Broadway, which is 150 feet, and Bath avenue, which is 125 feet in width. The former bisects the heart of the city east and west, and is lined with the residences of the wealthy. The latter divides it north and south, extending from the bay to the Gulf, and when paved and improved will be one of the finest driveways in the country. For breathing spaces the Galveston City Company reserved every tenth block between Avenues F and G for public parks, and nine blocks lying north of Avenue A and between Seventh street on the east and Tenth street on the west were ceded to the city for a public park. The block now occupied by the beautiful Ball High School Building was reserved for a site for the City Hall, which is now on a broad plaza on Twentieth street between Market and Strand streets. These, with lots for church sites, schools, hospitals, fire-engine houses, were ceded by the Galveston City Company to the city of Galveston, with the stipulation that if used or disposed of for any other purpose than that named in the cession, the property would revert to the Galveston City Company. The only instance where this right was waived was to the block now occupied by the Ball High School Building, and this waiver was made in consideration of the magnificent gift of philanthropist George Ball for the purpose of establishing a high school in conjunction with the public schools of the city and his selection of this site for the building.

As soon as the new republic was recognized by the great nations, commercial enterprise began the exploitation of the new territory. The steamship Columbia, the pioneer of the Morgan Steamship Line, was the first vessel to enter the port from New Orleans. Other vessels from the United States and foreign nations came with cargoes and in search of traffic. Packet lines were established between New York, Philadelphia and Baltimore and Galveston, while the traffic from New Orleans rapidly grew. Immigration from the United States and Europe flowed in to people the lands of the new El Dorado. Large mercantile houses were established, and the trade of Galveston expanded. To meet the requirements and encourage this commerce by providing suitable landing facilities, the Galveston City Company donated a number of wharf privileges to individuals on condition that they would erect wharves. Subsequently rivalries of various wharf owners, threatening the development of the port, led to the promotion by Colonel Menard of the Galveston Wharf Co., with a capital stock of $1,000,000, divided into shares of $100 each. The company was incorporated in 1854, and in June the stockholders elected as directors Michel B. Menard, Samuel M. Williams, E. B. Nichols, Stacy B. Lewis and Is Le Clere, and Michel B. Menard was elected president, and Is Le Clere, secretary and agent. Under Colonel Menard's energetic administration the private wharves were improved and enlarged, and a uniform wharfage charge established.

During the Civil War Galveston's commerce vanished. The port was rigidly blockaded. When peace was proclaimed and the port again opened the wharves were in such dilapidation that they virtually had to be rebuilt and greatly enlarged to meet the requirements of a constantly-augmenting commerce. While the company was expending vast sums of money in bettering the port facilities and enhancing its trade, suit was instituted against it by the city for street right of way to the channel. This was resisted by the Wharf Company, which claimed a clear title to all water-front property north of Avenue A to the bay channel, and between the west side of Tenth street on the east to Thirty-third street on the west, under deed from the Galveston City Company. After costly and protracted litigation the cause was compromised by the recognition of the city's one-third interest in the Galveston Wharf Co.'s holdings and the issuance to the city of 6222 shares of the Wharf Company's stock at a par value of $100 per share, now one of the most valuable assets of the city. The adjustment of this suit gave the Galveston Wharf Co. exclusive control of the water-front property extending from Tenth street on the east to Forty-first street on the west.

All obstacles being removed, and its revenues largely augmented by an increasing traffic, the Galveston Wharf Co. inaugurated a more substantial system of improvements, including the construction of a railway connecting all its wharves with the railways running into the city. As the traffic of the port increased the Galveston Wharf Co. expanded to meet its requirements, and in 1889, when Mr. J. M. Brown was elected president, the company had a solid line of substantial wharves extending from Sixteenth to Thirty-third street, and work had been commenced on pier 15. Mr. Brown brought to the discharge of his duties the ability that was required to give Galveston a system of wharfage unexcelled by any other port in the country. He had broad and liberal ideas, and while alert and progressive, he was eminently practical. He had an abiding faith in the feasibility of the plans of the United States engineers, and often consulted with them, and when they assured him that under their plan of harbor improvements they would succeed in getting a permanent depth of eighteen feet across the outer bar at low tide, he planned his wharf improvements accordingly, and constructed piers 12, 13 and 14, completed pier 15, and he erected Elevator A on pier 14 at a cost of $250,000 and a capacity of 1,000,000 bushels, and equipped with the latest modern appliances for the expeditious handling of grain.

When twenty-five feet of water was obtained over the outer bar, instead of eighteen, as predicted by government engineers, by the completion of the jetties to the crest of the bar, Mr. Brown remarked that the only mistake that he made in his plans was that he did not construct the company's improvements on the basis of a depth of twenty-five feet instead of eighteen feet. He predicted that Western as well as Texas grain would move through this port in an ever-increasing volume. Since 1895 Galveston has exported 55,403,912 bushels of wheat and 27,208,002 bushels of corn. The grain movement increased so rapidly that Mr. Leon Blum, who succeeded Mr. Brown in the presidency, contracted for the erection of Elevator B, with a capacity of 600,000 bushels. In 1897 Mr. Waters S. Davis succeeded Blum, and built Elevator B.

In 1898 George Sealy became president of the Galveston Wharf Co. He was a broad-gauged man in the fullest sense. Ever since his active identification with the city, he, with his firm, Ball Hutchings & Co., now Hutchings, Sealy & Co., were in the advance in promoting the commercial and industrial interests of Galveston upon broad and comprehensive lines, and soon after the war carried to success the establishment of the New York & Texas Steamship Line, better known as "The Mallory Line," whose magnificent steamers now ply bi-weekly between this port and New York, and whose outward tonnage in 1901 was 128,000 tons and inward tonnage 142,000 tons. In co-operation with his brother, John Sealy, backed by the financial prestige of his firm, the Gulf, Colorado & Santa Fe Railway was resurrected, and today is one of the finest and best-equipped revenue-paying railways in the Southwest, and a fitting monument to their genius and great business sagacity, as well as important factor in the development of the city. With this wide and versatile experience, Mr. Sealy brought to the discharge of the multifarious duties of the presidency of the Wharf Company the very elements required to enlarge and improve upon the broad plans of his predecessor, Mr. Brown. Under his vigorous administration piers 10, 35, 36 and 37 were constructed, and other improvements were made.

In the midst of these the direful hurricane of September, 1900, descended upon the city, wrought death and destruction, and well-nigh total ruin. From a property-value view the Galveston Wharf Co. suffered the greatest loss. Its property was an indescribable scene of wreckage, but before a majority of the people of the city had recovered from the shock, the Galveston Wharf Co., under the able direction of President Sealy and General Manager Bailey, had large gangs of laborers and mechanics employed, and in a fortnight such progress was made that freight was received and grain was spouted into the holds of vessels from Elevator A. This prompt and vigorous commencement of the work of restoration and the appropriation of $400,000 for the purpose was an evidence of the sublime faith the company had in the city's stability and its future progress. It was inspiring, and it aroused and enthused the terribly stricken people with a new-born hope that there was yet life in the city and a glorious future ahead if they would but imitate the example of the Wharf Company. It was the ray of light in the night of appalling darkness, and its effect was most salutary.

The Mallory docks, which were almost wholly destroyed, were rebuilt upon a more extended and elaborate scale, extending from Twenty-third street to Twenty-sixth street; the grade of the foundation was raised four feet, on a level with the car door; freight conveyors were placed within the immense sheds that cover the docks, which are equipped with every up-to-date appliance for the quick dispatch of traffic. It is doubtful if there is a better-equipped dock in the United States.

The wharves are all shedded, and are supplied with fire plugs, with ample hose attachment always connected for instant use. Fire-alarm boxes of the American District Telegraph Co. are placed at every available point in the sheds, elevators and offices of the company on the water front, which at night is illuminated with arc and incandescent lights. In consequence of these substantial improvements and the precautionary measures adopted against fire, minimizing the risk, a reduction of 10 per cent. of the insurance rate on the company's property has resulted.

All these practical, up-to-date improvements for the betterment of the port facilities were brought out under President Sealy's administration. In furtherance of his enlightened policy he reduced the wharfage charge and publicly announced that as the business of the port increased the wharfage charge would be reduced in a corresponding ratio.

The charges now on the leading export products are: Grain, one cent per bushel, includes cost of unloading cars, fifteen days' storage, wharfage and delivery to vessels—one-fourth of a cent a bushel for every ten days thereafter; cotton, one and one-half cents per 100 pounds; cottonseed cake and meal, one cent per 100 pounds; trackage, fifty cents per loaded car; insurance on grain, 2 per cent.

President Sealy was as broad, liberal and humane in the operations of the Wharf Company's affairs as he was in all the other relations of life, and in the labor employed by the company under his administration, as well as his predecessors, was treated with fairness and justness, always receiving the highest wages. This kindly consideration for its wage-earners protected the company from strikes that have been so disastrous to other corporations.

The wharf front of the Wharf Company now includes three grain elevators with a combined storage capacity of 2,750,000 bushels, a lineal frontage of five and one-tenth miles, wharf floor space of 1,972,300 square feet, or practically forty-five acres, all of which is practically covered with sheds capable of housing a half-million bales of cotton; thirty-two miles of 70-pound steel rails, over which 1000 loaded cars per day can be handled; a substantial marine way, where the company's dredges and small-sized vessels can be hauled out and repaired, and a creosote works, where the piling and lumber for submerged structures are saturated with creosote.

Among the industries that have sprung up on the water front through the encouragement of the Wharf Company are the Texas Star Flour Mills and Rice Mills, valued at $400,000. The flour mills have a capacity of 800 barrels per day, which can be easily doubled at slight expense.

The Red Snapper Fishing Co. is doing a large business, and to meet its increasing demands and augment its fleet has a steamer now on the ways, which, when completed, will cost $90,000. The Moody Compress is on the Wharf Company's property, and has a compressing capacity of 1200 bales per day. All these are important factors in the city's commercial and industrial development.

At the anual meeting of the Galveston Wharf Co. on January 6 statements were exhibited showing that in the fiscal year ending November 30, 1901, the receipts were $902,741.24, and the expenditures $902,741.24. The following items are embraced in the expenditures: Dividends paid, $127,401; permanent improvements, Mallory dock and railroad tracks, $71,689.50; new dredgeboat, $7439.66; barge office, $600; total expended for permanent improvements in 1901, $79,729.16; material and cash on hand, $29,676.59.

The following financial statement for the fiscal year ending November 30, 1901, gives the assets and liabilities of the company:

ASSETS.

Office building	$9,000 00
Creosote works	7,500 00
Marine ways	5,000 00
Tug Cynthia	5,000 00
Elevators "A" and "B"	405,000 00
Dredging plant	30,439 66
Material on hand	33,031 02
Individuals and accounts	3,770 48
Wharf R. R. and right of way	1,329,337 09
Wharves, piers, warehouses, wharf privileges and real estate	3,307,101 08
Cash on hand	19,552 99
	$5,154,732 32

LIABILITIES.

Capital stock	$2,626,600 00
Five per cent. bonds	1,600,000 00
Six per cent. bonds	500,000 00
Notes to repair storm damage	300,000 00
Bills payable (notes for real estate purchased)	67,252 32
Interest due and accrued	43,544 00
Dividends unpaid	17,336 00
	$5,154,732 32

The following summarized statements of the Wharf Company show the immense amount of product handled by the company, and give a very gratifying exhibit of the trade of Galveston one year after the storm had laid the city virtually in ruins. It is an eloquent evidence of the indomitable energy and zeal of the city's financial and commercial community, and is a favorable augury that her future achievements will be on a grander scale. The record of foreign exports for the fiscal year ending November 30, 1901, were as follows:

Number of ships cleared	362
Cotton, round bales	262,015
Cotton, square bales	1,887,595
Total cotton, pounds	1,056,083,761
Wheat, bushels	16,389,903
Oilcake, pounds	77,501,939
Cottonseed meal, pounds	489,701,973
Lead, pounds	6,993,825
Spelter, pounds	504,102
Oil, barrels	121,153
Staves, pounds	10,713,400
Lumber, pounds	59,766,148
Logs, pounds	4,906,939
Flour, pounds	27,706,046
Copper matte, pounds	9,956,803
Ixtle and zacatan, pounds	265,497
Ore, pounds	1,052,184
Merchandise, pounds	2,801,701
Cattle	2,110

The following is the record of coastwise business for the Wharf Company's fiscal year:

Imports:	
Coal, tons	147,922
Merchandise, pounds	281,736,801
Exports:	
Number of ships cleared	106
Cotton, round bales	21,571
Cotton, square bales	370,653
Weight of cotton, pounds	201,449,899
Wool, pounds	15,414,338
Plaster, pounds	8,798,000
Merchandise, pounds	9,625,328
Pecans, pounds	394,035
Lead, pounds	3,492,375
Fertilizers, pounds	400,000
Oil, barrels	7,890
Jute butts, pounds	65,200
Lumber, pounds	375,864
Logs, pounds	635,150
Flour, pounds	358,490
Copper matte pounds	1,445,550
Ixtle and zacatan, pounds	1,224,795
Rice, pounds	419,200
Wine, barrels	1,552
Molasses, barrels	3,131
Hides and skins, pounds	2,606,327
Cottonseed meal, pounds	1,803,600
Cement, pounds	1,604,975

A comparative statement of cars handled shows that the Galveston, Houston & Henderson handled 46,473 during the fiscal year, against 39,037 the year before; the Gulf, Colorado & Santa Fe 32,145, against 27,014, and the Galveston, Houston & Northern 16,043, against 10,025, a net increase for 1901 of 14,002 cars. These figures include only such products as went to and from the ships' sides, and have no reference to shipments by jobbers, wholesale merchants and manufacturers located here.

During the same period receipts at Elevators A and B were 14,782,014, against 13,504,938 bushels of wheat, and deliveries to ships were 15,197,578, against 14,506,960 bushels.

Secretary John E. Bailey, in submitting his report to Vice-President Landes, in part said:

"The present physical condition of the company's property is such that will enable us to handle a much larger volume of business than has heretofore been offered without any additional expenditure beyond ordinary repairs and maintenance."

Vice-President Landes, in his annual address to the stockholders, said:

"The year just closed is, perhaps, one of the most eventful in the history of the company since its organization in 1854. You have now its complete restoration from the wreck in which it was left by the September storm, and its physical condition today is in better shape to handle satisfactorily its increased business than ever before. The stockholders have received dividends amounting to 6 per cent. during the past year, and of a bond issue of $1,000,000, authorized at your meeting one year ago, only $100,000 have been issued, and the proceeds of this sale was applied to take up like amount borrowed to repair storm damage."

He also very feelingly alluded to the loss the company and the community had sustained in the death of President George Sealy, and appropriate resolutions were adopted commemorative of his nobility as a man, his worth as a citizen, and their profound regret at his loss.

The stockholders elected as directors for the ensuing year H. A. Landes, Charles Fowler, H. J. Runge, John Sealy, Sealy Hutchings and R. Waverly Smith. The three city directors are Judge W. F. Austin, H. C. Lange and I. H. Kempner. The directors elected John Sealy, president; H. A. Landes, vice-president; John E. Bailey, secretary-treasurer; J. J. Davis, assistant secretary and cashier.

The majority of the board of directors and officers of the company are young men in the very fullness and vigor of life, clear-headed business men, brimful of energy, broad-gauged and progressive, and it is safe to predict that under their guidance this great and powerful factor in the development of Galveston's trade possibilities will be directed along broad lines that will redound to the greatest possible good for the city, for the State and that vast empire lying north of Texas, teeming with diversified products, that will find an outlet to world markets through this port. This will be the policy of Mr. John Sealy, who succeeds his lamented uncle in the presidency of the company, who, in speaking of the policy he would pursue, said: "As far as it is in the scope of my ability as president of the company, I intend to carry out the plans and policies of my uncle in the direction and management of its affairs, meet promptly and provide for conditions as they arise, and always hold out every inducement and encouragement to traffic either seeking an outlet or inlet through Galveston." In this he will receive the hearty support not only of the board of directors and stockholders of the Wharf Company, but of the entire community, whose confidence and respect he commands on account of his sterling character, his excellent business ability and his generous and humane manhood.

Critics may carp, pessimists may make dire predictions, but Galveston will live, grow and become a grander and more prosperous city than the most optimistic have dreamed of. A city that can add $100,000,000 to the export wealth of the nation the year after her frightful cataclysm cannot be crushed.

C. W. HAYES,
Manager Texas Associated Press Bureau.

Why Does Atlanta Lead the South?

This question is on every man's tongue, because Atlanta's leadership is universally recognized, and there is a general desire to know how she maintains that position. If you would know the secret of it, read and ponder well the statements which follow.

Atlanta is the railroad center and the natural distributing point of States which contain the richest resources that nature has spread out on this earth in equal space. Naturally, everything that is forceful and influential gravitates to this point. In this way a vast amount of industrial, commercial, moral and intellectual power has accumulated here. Atlanta is both the storage battery and the generator of energy for the whole South. It accumulates and produces wealth, quickens the pulse of industry, and sets the pace for the South. It is the hub of the Southern universe.

It is in this way that Atlanta became the insurance, financial and business center of the South. Manufacturing and business interests of national extent, almost without exception, make Atlanta Southern headquarters. This is why there is such a great demand for office buildings here. It explains the fact that the heart of Atlanta, with fireproof, steel-frame buildings ten to fourteen stories high, resembles the lower part of Manhattan Island.

Another important factor in Atlanta's growth is the fact that it is the most desirable place of residence in the South. With an altitude of 1052 feet above sea, it has a bracing air that gives health and energy. People feel like doing something all the time, and there is something worth while going on at every season of the year.

Atlanta is a center of industry. It has a greater variety of manufactories than any city in the South, and for this reason its prosperity is uniform and continuous. This fact is shown by the steady increase of bank clearings, which have about doubled since 1894.

As an educational center Atlanta's leadership is equally pronounced. It begins with the public schools, and ends with the finest polytechnic institute in the South, which has special departments for electrical engineering and textiles, as well as one of the finest courses in mechanical engineering to be found in the United States.

The people are cosmopolitan, hospitable, energetic, broadminded, hearty, wholesouled and up-to-date. Public spirit is contagious, and there is a healthy moral tone which is to be expected in a city of schools and churches. There are special schools for law, medicine, dentistry, business and many other things. The opportunities for education, either general or technical, are rarely equaled. The press is the strongest in the South.

If you are seeking such a place for investment or residence, write the Chamber of Commerce, Atlanta, for information.

Trinity College, Durham, N. C.

Among the colleges of the South, perhaps Trinity has had the most remarkable growth. Ten years ago it was a small college located in a country village and owning but one building. Then it was struggling against extreme limitations, financial and otherwise. Today it is a college community composed of twenty-one buildings, occupying a beautiful campus of seventy-five acres, located in the city of Durham. Within the past ten years more than $700,000 have been invested in endowments and equipments, which makes Trinity the largest and best-equipped college plant in the South Atlantic States, and has given it a leading rank among the educational institutions of the entire South.

Remarkable as this material growth has been, the development of new policies, right standards and modern methods are even more striking. Two things have hindered the growth of higher education in the South: First, there has been a need of money; secondly, political influences have too largely controlled college policies. These two causes have forced the Southern colleges to a most hurtful conservatism and localism. It remained for Trinity to adopt an aggressive and new policy, which is no less than a reformation in higher education in the Southern States.

Three things are prominent in the policy of Trinity.

1. It seeks to produce a spirit of American nationalism. This is its civic spirit. Instead of adopting local ideals and creating local faiths, Trinity College strives to inculcate a broad spirit of patriotism and a civic conscience that responds to national duties and loyalty.

2. It stands for intellectual freedom. Scholarship and statesmanship can never be developed in an atmosphere limited by traditions, partisanships, bigotry and other enslaving influences. The student must have a right to study; the college must have the right to teach. These rights mark one of the distinctive features in the policy of Trinity College.

3. It stands for scholarship. Its entrance requirements, courses of study, methods of teaching are all determined by the sole aim of producing a scholarly type of man. The records of the college show that more than 25 per cent. of its graduates enter the larger universities of America to take graduate courses, while it is recognized among Southern educators that Trinity has the opportunity to do much for the advancement of higher education, and is using the opportunity within its reach.

What has been done within the past ten years seems only to indicate a larger growth. New chairs, new buildings and new equipments are being planned and constructed, and what the next ten years of growth will show cannot be prophesied by the most sanguine friends. The president of the college is always on the lookout for the best type of men for the faculty, and ready to adopt any new scheme for the advancement of educational work in the Southern States.

Mr. J. B. Duke of New York has given to the college a library building, and the purpose of the college is to build up a great library, which will bring within easy reach of Southern students the best facilities for advanced study and research. It is remarkable that with these increased equipments and expenditures the expenses of a student at Trinity College are less than half the expenses at colleges of like grade in the Eastern States. It is evident that Trinity College is becoming the representative of a new and vigorous spirit of progress in the South.

Shreveport for Health and Business

Its Advantages and Its Progress

Shreveport, population 26,887, the second city of Louisiana, is located in one of the healthiest regions of the South, and has a resident death-rate of 16.03. These are facts that the federal census could have published to the world had the enumeration and compilation of statistics regarding Shreveport been absolutely accurate.

The census report as it was actually given to the world, however, gave Shreveport a population of but 16,013, and placed that city in the very unenviable position of having the highest mortality of any city in the United States. And thereby hang two tales.

When the population division of the census bureau published the fact that Shreveport had a population of but 16,013 the authorities of that city at once protested against the report, and presented reasons why the census of that city should be retaken. They showed that the enumeration was made during the summer, at a time when a large portion of the white population was spending the heated season at Northern and Eastern resorts; at a time, too, when the major portion of the city's colored population was engaged in the cotton fields in adjoining parishes. The authorities cited numerous cases of non-enumeration and presented other arguments in favor of a retaking of the census. They claimed a population of 26,887, and based the claim on the city directory of 1900, which contained 7682 names, not including women and children. At the very conservative ratio of 3½ to 1, Shreveport's estimated population at the time the directory was compiled was 26,887. In spite of these representations, however, the application of Shreveport for a re-enumeration was refused, and Shreveport had nothing to do but to await the second body-blow from the government. This came in the form of a report from the health statistics division of the census bureau, placing Shreveport on the list with a mortality rate of 45.5, the highest in the United States.

Again the authorities of Shreveport attempted to effect a correction of the published statistics of the census bureau, and again their efforts proved of no avail.

While the underrating of Shreveport's population was the most important factor in giving that city a high death-rate, it constitutes by no means the only argument against the misleading statistics published by the government.

Dr. J. C. Egan, health officer of the city of Shreveport, during an interview regarding the government report, made the statement that when the department called on him for data, a request was made for a report for seven months, and subsequently an additional seven months' report was called for, both of which he supplied, not knowing at the time that the mortality of Shreveport for fourteen months would be used as the basis for a health report covering one year. That such an error was made would seem patent from a careful perusal of the following statement made by the Shreveport Board of Health:

"The census bureau of vital statistics, through some error in figures, either from a misunderstanding of statistics wanted in this office or the Washington office, has credited us with deaths out of proportion to our actual death-rate, actually and accurately kept in our office, as will be seen by inclosed certificate of deaths for the census year. Besides, they have added seventy-five deaths occurring in this city not reported by this office, turned in by the census-takers.

"Take our actual figures, resident and non-resident, which includes all who have died in our midst, and see the percentage with our estimated population of 26,000 people.

"Estimated population, 15,000 white, 11,000 black; total, 26,000 white and black.

"Total deaths, resident and non-resident, 583; rate per 1000, 22.4.

"Total deaths, resident and non-resident, whites, 209; rate per 1000, 13.9.

"Total deaths, resident and non-resident, blacks, 374; rate per 1000, 34.

"Resident deaths, whites, 135; rate per 1000, 9.

"Resident deaths, blacks, 282; rate per 1000, 25.6.

"Total, whites and blacks, 417; rate per 1000, 16.03.

"On the other hand, take our report as sent out from the census office.

"The population returned by census reports, 16,013; deaths accredited by bureau, 741; less 13 still births striken out, leaves a total of 728, and gives us an excess of 145 more deaths than occurred in the city during the census year 1900.

"Deaths, census report, total, 728; population, 16,013; rate per 1000, 45.5.

"Deaths as books show, 583; population, 16,013; rate per 1000, 36.4.

"It can readily be seen by comparing the two that if we were properly reported as to deaths, even with our inaccurate census, we would be relieved of the stigma of having the largest death-rate in the United States."

Even the very low death-rate shown by the board of health is still further minimized when the peculiar conditions surrounding Shreveport are considered. Shreveport is the geographical and commercial gateway of the great State of Texas, of Indian Territory, and of the States of Arkansas and Mississippi. Not one of these great Commonwealths maintain a charity hospital. The State of Louisiana maintains two, the one for North Louisiana being located at Shreveport. Therefore it is natural that the railroads and general floating population in the northern part of our State, as well as those of the four great Commonwealths, should seek the charity hospital located at Shreveport. During the twelve months under discussion 166 out of the 583 deaths reported by the board of health were non-residents.

Statistics show that Louisiana's percentage of deaths among old people places her possibilities for long life second in all the States of the Union, Vermont being first. Again, her position as regards lowest rate of death from consumption, a disease very dependent on climatic conditions, is fifth among the States of the Union. Her percentage of deaths among children places her above any of the States in the cotton belt. Regarding mortality from malarial fever, she is superior to Alabama, Arkansas, Mississippi and Florida, and stands on a par with Texas. These things being conceded, let us look at Shreveport's location. She is situated among the hills of North Louisiana, the highest points of the State. This affords her the healthful advantages that always accompany altitude and an excellent natural drainage, placing her above the fever belt and making her practically immune from all virulent types of disease.

In spite of these adverse reports regarding Shreveport and her health conditions, Shreveport enjoys and deserves the reputation of being one of the most progressive of the South's progressive cities. Her prosperous condition is due largely to her natural advantages, but still more, perhaps, to the progressive spirit of her business men.

Realizing that railroads are the most important factors of the upbuilding of a great commercial and industrial center, her tireless business men early began a campaign for more of these "arteries of commerce." As a result, more railroads now enter Shreveport than enter any city of equal population of the United States. These railroads have cost money, but the business men who inaugurated the movement have provided the means, and during the past five years over $750,000 have been expended in securing railroads. As a result, eight roads center in Shreveport, furnishing railroad facilities equal to those of New Orleans, twice those of Mobile, and three roads more than her prosperous neighbor, Dallas, Texas.

These lines bring to Shreveport the products of more than 150 miles in all directions, and enable this fortunate city to hold the position as the foremost center of the great Southwest. These lines brought into Shreveport last year more than 320,000 bales of cotton, making her the third largest inland cotton market in America. Another large contributor to Shreveport's commercial greatness is the River Red, of which Shreveport is the head of all-the-year-around navigation. The presence of the Red is an ever-standing menace to the railroads, compelling them to give Shreveport the water rate that is the "open sesame" to commercial prosperity.

Four cotton compresses, one of which is the largest in the world, take care of Shreveport's immense cotton trade. Three cotton-oil mills are located there. Five banks transact her financial business, with clearances amounting to more than $300,000,000 a year. A cotton mill numbered among her enterprises is called the Hargrove Mill, after the lamented philanthropist, H. H. Hargrove. More than 100 other enterprises pay Shreveport labor over $1,000,000 per year. Extensive shops of several of the roads constitute an important element of wealth to her local commerce.

And this is the city regarding which the United States government reports a population of 16,013 and a rate of mortality greater than that of any city in the Union.

Is it not possible for enumerators to make mistakes, for routine compilations to err, for the government to unintentionally commit an injustice toward one of her wards? On the other hand, is it possible for a city of progressive men to build five railroads in as many years, and at the same time increase the population of that city but a few hundreds? Is it possible for a city to more than double her cotton receipts in three years, becoming the third inland cotton market in the world, without materially increasing her population? Is it possible for a city to extend her limits, taking in a number of populous suburbs, without bringing about more than a normal increase in her population? Is it possible for a city having the healthful altitude and natural drainage of the Northern cities with the mildness and salubrity of those of the South, to be the unhealthiest city in the United States? Is it probable that a city which installed the first water and modern sewerage system in her State, and is consequently free from epidemics, would have a death-rate higher than that of any American city? Hardly.

These truths being self-apparent, let her sister cities of the South in their world-famed magnanimity assist Shreveport in erasing the blot which our government has unintentionally placed on her escutcheon.

Newport News: Its Past, Present and Future

The Greatest Shipyard in America, with $22,000,000 of Work on Hand

By ALBERT PHENIS

Easily the most important enterprise in the South, as it is nearly, if not quite, the biggest thing of its kind in the world, is the Newport News Shipbuilding & Dry-Dock Co. From it the fastest warship of its class in any navy has been turned out, and its merchant vessels are destined to carry the flag of the United States to the uttermost parts of the earth, and so famous for excellence have the products of this yard become that $22,550,000 worth of work is now on hand, including six war vessels for the United States government.

This great shipyard, representing an investment of $15,000,000, is one of the monuments to his enterprise and sagacity left behind him by the late Collis P. Huntington. It is the nucleus around which has been built a thriving city of 25,000 busy people. And it is a furthermore remarkable fact that all that has been accomplished here covers a period of something less than the life of the Manufacturers' Record. It is related that Mr. Huntington, when he first saw Newport News in 1840, was deeply impressed with the possibilities of the point, then practically a wilderness. After his great achievements in railroad building in the West and South, he brought the terminals of the Chesapeake & Ohio Railroad to Newport News, made them the greatest in the country, and at the same time established the shipbuilding plant, and by the operations of his Old Dominion Land Co. created this populous, important and growing city.

It was in the fall of 1880 that the Old Dominion Land Co. was incorporated. A tract of about 18,000 acres of land had been secured at the instance of Mr. Huntington, and in 1883 the Warwick Hotel, which is still one of the most comfortable of hotels, was opened to the public, in accordance with the prevailing custom of starting off a new city with a good place to house the visitor. While pushing the city as rapidly as the circumstances would allow, the dry-dock and shipbuilding enterprise was being worked out, and in 1886 the Chesapeake Dry-Dock & Construction Co. was incorporated. It was in 1890 when, under its present name, the company began the construction of ships, and since that time there have been launched and completed thirty-two vessels. Of these, six were built for the United States government, three being first-class battleships and three gunboats. In addition to this, merchant vessels flying every flag known to the world

have been repaired at the works. During the Spanish-American War, when the United States government was in urgent need of ships, this plant converted many steamships into auxiliary cruisers, besides fitting out the hospital ship "Solace." The total tonnage of merchant vessels built and now building is 111,735, and the total displacement of warships built and now building for the United States government is 105,930 tons.

During the year 1901 the company launched seven vessels, six for the merchant marine and one first-class battleship. The total tonnage of ships built in 1901 was 53,520. In addition, the North German Lloyd steamship "Main," one of the victims of the awful Hoboken fire of June, 1900, was rebuilt here at a cost of more than $600,000. It is an important fact that two of the merchant vessels launched in 1901, the "Siberia" and "Korea," for the Pacific Mail Steamship Co.'s Oriental service, are the largest ships ever constructed in the United States. They are of 18,400 tons displacement each, which is some 1400 tons more than that of the largest United States battleships. These ships are now about ready to start on their maiden trip around The Horn to ply between San Francisco and Japan.

The year 1901 was a busy one at this shipyard. Besides launching the vessels mentioned, the company contracted with the United States government for and is now building the armored cruisers "West Virginia" and "Maryland," the battleship "Virginia" and protected cruiser "Charleston." Two other vessels for the United States government, the monitor "Arkansas" and battleship "Missouri," which were previously contracted for, are in course of construction, making a total of six warships now building here. The total value of work now on hand is about $22,550,000, and a contract has been closed for the construction of a new boat for the Old Dominion Steamship Co., which will be better than the best of the ships in that service. It will be on the lines of the "Jamestown" and "Princess Anne," with improvements.

During the past year the company delivered to the United States government the battleship "Illinois," which is to be the flagship of Admiral "Bob" Evans, and will be used by him to receive Prince Henry. On her official trip the "Illinois" proved to be the fastest warship of her class in the navies of the world, and exceeded her speed allowance by a margin which earned a handsome bounty. A sentimental feather in the cap of the company is the fact that the "Nashville," one of the vessels built here, fired the first shot and captured the first prize in the Spanish-American War.

During 1901 there was also completed the new mammoth dry-dock of the company, the largest on the American Continent, and one of the two largest in the world. The original dry-dock was a pretty good one itself, being 612 feet long by 130 feet wide, with a draught of water over sill of twenty-five feet, but the new one has a length of 827 feet, a width of 162 feet and a draught of thirty feet, which enables it to accommodate the largest ship afloat. Two battleships may be docked in it at one time with ease. One of the vessels recently placed in this dock was the German cruiser "Vineta," the first German warship ever docked in America.

The cost of the new dock was nearly $1,000,000. With the completion of this dock the company is particularly well equipped for carrying on repair work, of which an immense amount is done.

While any but an expert might fail to fully appreciate the excellence of the great plant's equipment, its magnitude and completeness appeal to the most uninitiated. The shipyards are located on a tract comprising 120 acres, and the six enormous brick machine shops cover ten acres. Walking through the yards, seeing the skyscraping traveling cranes, witnessing the operations of the titanic machine tools, and the smaller tools driven largely by electricity and compressed air, ready acquiescence is given to the statement that the most modern machinery is here employed, and that no plant in the country is better equipped. It is pleasant to remember that Mr. Huntington lived to see the plant reach its present efficient state, and knowing how thoroughly a man of action he was, it is easy to conceive of the thrill of enthusiasm he must have felt when he saw the first boatload of exports leave his new port, and with what joy he witnessed the transformation in his shipyards of a few thousand dollars' worth of raw materials into a fine finished vessel with a value of some half a million of dollars. Although the founder of the enterprise has passed away, his spirit still pervades the place. C. B. Orcutt of New York, the man he chose as president of the shipbuilding company and land company as well, is still the efficient head of both enterprises, and everything is running along as its creator would have it do. The facilities of the plant are practically unlimited, though improvements are under way and others are in contemplation in order that the greatest possible efficiency may be maintained. There are six piers along the water front of 2600 feet, and the plant contains an outfitting basin 900x500 feet in dimensions. The executive officer on the ground is W. A. Post, general superintendent, who has also been with the company from the start. Seven thousand people now draw wages from this one enterprise, and the $65,000 that is every week paid out to workmen furnishes the life-blood of the community.

It is impossible to speak of Newport News, now become one of the most important ports in the export trade of the country, as well as having the greatest shipyard, without a reference to the operations of the Old Dominion Land Co. Here is a development company which others with like ambitions might do well to study and emulate. Nothing has been done in the development of the city which has not been fostered or fathered by this company, and up to the present moment it is the leading spirit in every enterprise undertaken. Until 1896 the company was practically the town, for although there were nearly 5000 people in Newport News by the census of 1890, and the census of 1900 gave the city 19,635, there was no incorporation as a city until in 1896. During all those years the land company was practically the city of Newport News, and the phenomenal growth the city showed in population and business may properly be ascribed to the enterprise of its promoters and managers.

The visitor of today finds here a finely-organized and well-built city, with three miles of asphalt streets and bonds in bank to build four miles more of the same sort of streets. He finds an excellent sewer system, good public buildings and business houses, preparations being made for the construction of a $250,000 government building, and schoolhouses and churches equal to those of any city of the same size in the country. There is still a low tax rate, and a certainty that some day there will be here a city of 500,000 people, extending from North Newport News to the government reservation at the famous Old Point, nine miles away. There is a continuation of houses all the length of the electric street-car line, which connects these points at this time, and the ultimate consolidation of the whole section into one city is a foregone conclusion. Efforts are being made by the Old Dominion Land Co., seconded by others, to secure small industries for Newport News, and with the advantages offered it would seem but a matter of time when their efforts would be successful. Manufactures of sash and doors, furniture, vehicles, etc., and the iron industries are mentioned as some of the enterprises which would find here conditions to their liking. When New England can haul in her raw material, and fuel as well, and still make goods which she can advantageously sell to the sections from which the raw materials come, it would certainly appear that a point like Newport News, which is closer to the raw materials, and which has unrivaled shipping facilities, ought to have a future of large proportions as a manufacturing city in many lines of goods—cotton, iron and wood especially. The question of labor is a point of importance in this connection. It appears that most of the hands in the shipyards and in the railroad terminals are adults. There are over 5000 children in Newport News between the ages of five and twenty-one, and these are almost wholly unemployed. Thus the lighter manufactories would find an abundance of the kind of labor which is employed to advantage in the manufacture of cotton and silk fabrics, thread, leather goods, boots and shoes, etc. Coal can be obtained for $2.75 a ton. Climate, geographical situation and unequalled transportation facilities provide the other inducements.

The upbuilding of the city of Newport News is the aim and purpose of the Old Dominion Land Co., and it is striving as hard along those lines as in the earlier days of its existence. The report is made by the officers, of whom L. B. Manville is chief, that the rate of progress of the city continues to be rapid, exceeding that of most cities of the country. Sales of lots go steadily on at firm prices, and the growth of the city is continuous. As showing the enterprise of the land company, besides owning the Warwick Hotel, it owns and operates the large merchandise pier known as Pier A, which is patronized by all the smaller sailing vessels, as well as by the passenger and freight boats of the Old Dominion Steamship Co.

What kind of a port Newport News has grown to be is shown in the statistics. Exports for ten years ending June 30, 1901, were $212,885,859, and are now about $35,000,000 per annum. The total value of imports is given as $33,393,166 for the same ten years.

Transportation lines include the Merchants and Miners,' daily between Newport News and Baltimore and tri-weekly between Newport News and Boston and Providence; the Old Dominion Line, daily between Newport News and New York; the Clyde Line, to and from Philadelphia, and later Charleston, besides steamships which ply between Newport News and ports of the United Kingdom, Germany and other European countries. The $7,000,000 terminals which have been established at Newport News by the Chesapeake & Ohio Railroad and the mammoth grain elevators of the road have been prime factors in the enormous development of the flour, grain and breadstuffs exportations, which have been features of the trade of Newport News in recent years.

Of the magnificent harbor here the world knows. Not a dollar of government money has ever been spent or asked for this harbor, and yet the largest vessels come into port. It is now proposed to spend $100,000 in dredging the Middle Ground bar, and then the largest vessels in the world can come in at the lowest tide known.

MACHINERY AND MILL SUPPLIES.

A Strong Norfolk House Which Has Taken a Leading Place.

In the present flourishing condition of the Henry Walke Co., dealing in mill supplies, machinery and ship chandlery, an instance is afforded of the way Norfolk is attracting outsiders of push and conspicuous business ability. S. Milnor Price, the president of the company, though still a young man, has spent his life in the same business, having been till January, 1901, identified with a large house in that line in Richmond. Frank Harrison, vice-president, is an old hardware man from Lynchburg, and the business manager of the machinery branch is V. Basagalups, also from Richmond, thoroughly acquainted, in both a practical and a theoretical way, with all the details of the business, a good salesman and well known to the trade of Virginia and North Carolina.

This winning combination of bright, alert, up-to-date business men succeeded the old-established house of Henry Walke but little over one year ago, and now the company is settled in a fine, new, commodious house on Water street, especially constructed to afford the best possible facilities for conveniently and economically handling trade, and it has taken a position easily at the head of its line not only in Norfolk, but in this section. The new house is four stories high, 100 feet front on Water street, with an L of fifty-six feet front on Loyall's lane, and a depth of 130 feet. There is a floor space, all told, of 57,000 square feet. Every detail of the interior—the shelving, partitions, openings and hoists, and the arrangement of the stock—is admirably planned for handling the business at a minimum of cost, while at the same time the display is effective. At the first glance the visitor is impressed with the magnitude of the business done, the businesslike methods of the house and the variety and completeness of the stock carried.

In addition to the heavier and more common kinds of wares to be found in stock here, it is proposed to carry a complete sample of wood and iron working tools, which will be displayed on the floor of the salesroom, adding still further to the imposing appearance of the large first floor. The house is the agent for some of the best makers of machine tools in America, and is prepared to deal on the most advantageous terms with those wanting anything in that line.

Mr. Price, the keen, alert head of the house, has brought to the management of the business a thorough knowledge of conditions, outside and inside, which is one of the first requisites of success. He prides himself on knowing what the requirements of the section are, and he is prepared to supply every want in his company's line. In every possible way, too, he goes after business, and no part of his rightful field is left unworked. And then, as important as any other feature of the situation, he has so completely organized the business, and has surrounded himself with such efficient helpers and associates, that business proceeds with the ease and lack of friction of an automatic machine. Thus organized, and with physical conditions so perfected that every effort counts, that there are no "false moves" in the handling, sale or delivery of stock, he is in a position to get trade and to keep it, because the customers of the house can get what they want, can get it promptly, and can get every advantage in the way of prices that it is possible to obtain.

The Seaboard Air Line as a Builder in the South

By ALBERT PHENIS

It meant a great deal for the sections affected when John Skelton Williams of Richmond and his associates got hold of the Seaboard Air Line, for not only has the original Seaboard been largely extended and built up, so that a through-train service of the first class runs between New York and the extreme South, but extensions into undeveloped country are being made as well, and the interests of a wide section are being looked after in a thorough and broad-gauged manner. It was only after a vigorous contest that the Seaboard Air Line was secured by the Williams syndicate and the important system saved to the South as an independent road, and immediately, by purchase of additional lines and the construction of connecting branches, the present system of some 2700 miles was perfected. The old Seaboard system of something less than 1000 miles had long been one of the important local lines of the middle South, some of the roads in the system being among the oldest in the country, but it was not till the Williams syndicate secured control that the system became prominent as a through line between the great commercial centers of the North and the most rapidly-developing sections of the South. July 1, 1900, the Florida Central & Peninsular road, a thriving line of 945 miles, and the Georgia & Alabama, some 400 miles in length, were added to the system, and branches from Petersburg to Richmond and from Petersburg to Norlina were constructed, and also from Hamlet to Columbia, which provided for a through line over its own tracks between the North and the South. New engines and new cars were added to the equipment, until now the through trains which run from New York to Jacksonville and St. Augustine are as handsome and luxurious as those of any road in the South. The roadbed is also being rock-ballasted, and as rapidly as possible the work will be continued until it covers the entire system. At the same time the operating expenses of the road have been reduced, and the property has been put on a splendid financial as well as physical basis.

Extension work includes the construction of a road from Live Oak to Perry, in Taylor county, and from San Pedro to Suwannee, fifty miles in length, through primeval forests, where deer, turkey and bear are plentiful. A 40-mile line of the road from Turkey Creek to Palmetto, on the Manatee river, is another Florida extension of importance, as it penetrates the finest orange and trucking district of the State. The road will ultimately be extended to Boca Grande, near Punta Gorda, on the coast, giving a short line to Havana and the West Indies. On the northern sections of the road a proposed extension of great importance is a line from Charleston to Augusta, Athens, and thence to Chattanooga.

Conspicuous in the work of developing the Seaboard property is the improvement of the terminals, notably those at Savannah, where $1,500,000 have been spent in providing immense piers, warehouses, sheds, compresses, etc. The total water front of these terminals is two miles, and the total trackage is 43,642 feet. These improvements are on Hutchinson's Island, and of the 1800 acres which the island contains, the company owns 1200 acres. The island has been raised several feet, the water deepened at the piers, and altogether the improvements rank among the best of the kind in the country. Besides being important in itself, the port of Savannah is of additional importance to the Seaboard road because it is the terminus of the Georgia & Alabama division of the system. This division, which originates at Montgomery, Ala., where it has feeders in the Mobile & Ohio, the Louisville & Nashville and the Alabama river, traverses one of the richest agricultural and fruit sections of the South, which is also famous for its naval stores and lumber. The freight originating on this line is of great magnitude and value, and is constantly increasing. In the piney-woods section of the eastern part of this territory is the celebrated old soldiers' colony of Fitzgerald, now a flourishing and well-established city, and as the timber is cut off the country is rapidly settling up with farmers from all parts of the country, many of them being from the North, and they engage in the cultivation of grains, fruit and cotton with certain and adequate profit.

Important as the port of Savannah is, however, Fernandina, Fla., is to the road the biggest shipping point on the Seaboard Air Line. The road has built excellent terminals here, and as the government has spent $2,500,000 in giving twenty-six to thirty feet of water over the bar, thus permitting the largest ocean-going vessels to come up to the wharves, Fernandina has become the great shipping port for phosphate. One-half of the whole Florida output is handled by the Seaboard road through this port, and the exports from here represent 90 per cent. of all the phosphate exported from the State. Fernandina is also a large lumber-shipping point, and as the turpentine forests are being worked out further north, and the naval-stores supply is moving to the South, Fernandina is becoming of increasing importance as a naval-stores shipping point.

At present the most important point reached by the Seaboard on the west coast of Florida is the terminus at Tampa, brought into prominence during the Spanish-American War as the point of embarkation of all the troops who went to Cuba from this country. This city of rapid and important growth is now widely noted for its large cigar-manufacturing interests, which industry furnishes employment for a large number of skilled laborers, but as the government is engaged in dredging the harbor, and deep water will be secured for the place within a few years, it must grow in importance as a port for the importation and exportation of the varied articles which make up the commerce between this country and the West Indies. The proposition to extend a line to Punta Gorda must be taken as an evidence of the purpose of the Seaboard to keep abreast of the development of trade with the Antilles, and to provide every facility for the speedy and convenient handling of the commerce which will be built up.

A survey of the map of the Seaboard Air Line shows the comprehensive, broad-minded plans of the management, which has not only built up an air line between the North and the South, but has secured, as feeders to the main line, branch roads which reach out to about all the important centers on each side. Some of these great feeders are of recent construction, and others have been in existence for a longer period, but the older lines have now been consolidated into one harmonious system, and are greater as branch lines than before they became a part of the present organization. Thus at Norfolk-Portsmouth, the former northern terminus of the line, there have been extensive improvements made in terminals to accommodate the greatly-increased business, while the Old Bay Line steamers, between the Hampton Roads cities and Baltimore, have never done a greater business. Along the Wilmington-Rutherfordton line there has been a steady development, and at the Wilmington terminus recent improvements include a dredging out of the wharf front and extensive repairs to the Navassa yards, and the construction of house tracks to accommodate the growing industries of the place.

Along the Atlanta line, between Hamlet and the great Piedmont metropolis, there has been a steady development of agricultural and industrial interests, and the many thriving towns and cities along the route have shown a continued advancement. There is never but one story to tell of Atlanta, and that is of an unbroken record of development and advancement.

One of the most interesting facts connected with the development of the territory of the Seaboard is the vitality shown by Jacksonville in emerging from the devastating fire of last May. The way in which the 140 burned blocks have been rebuilt in the short time since the fire impresses one as scarcely less than marvelous, and especially when it is learned that but a small percentage of insurance was carried on the property destroyed, several million dollars of the loss being total. Although it is a hard struggle for the people of the city, which has never been accounted a rich community, the alacrity with which recovery is being made, and the better character of the buildings now being constructed, together with the substantial improvements in the wharfs of the city, give proof of the stamina of the people of Jacksonville, and promise a city of greater importance and commercial supremacy than ever before.

Hand in hand with the physical betterment of the Seaboard road and its terminal facilities have gone the efforts of the management to build up the country by inducing settlers and industrial workers to locate along the line. This work, for many years in charge of J. T. Patrick as industrial commissioner of the road, has not been confined to merely trying to get people into the country, but has aimed to make all—the newcomers and the old settlers—as prosperous as conditions of soil and climate would make possible. Thus between 400 and 500 industrial agents are located along the line of the road, whose mission it is to not only get emigrants and industries, but also to inspire the people with whom they come in contact to improve their surroundings and make the most of their opportunities. In this connection the company has established a traveling circulating library, with books on agriculture, dairy-making, horticulture, history, etc., and by a system of rotation people along the whole line, and schools as well, are given access to the best works of their kind on topics of practical value. Object-lessons on road-making, canning, dairying, utilizing the waste products of the farm, how to till the soil to the best advantage, and so on, are also given occupants of the land all along the line.

As a result of the efforts being made by the industrial department, new people and new industries are coming in from Richmond to Tampa. Many of the settlers are from New England, and they are engaging in truck-farming, fruit-raising and general agriculture. Between Portsmouth and Weldon and Hamlet and Wilmington truck-farming is largely pursued. An instance of the profits of this undertaking is given in the case of a man who cleared $1700 off five acres of Rocky Ford cantaloupes last year. Between Raleigh and Hamlet, in the Southern Pines section, out on the Georgia & Alabama division, and down in Florida, fruit-raising is largely and profitably engaged in. Near Jacksonville three young men have gone extensively into peach-raising. They have an orchard of several hundred acres, on which they raise the Honey peach, a sweet, small, red variety that comes early into market. They have made $150,000 in the past ten years. Knowing what and where to plant seems to be a matter on which advice is always desirable, and this is what the industrial bureau undertakes to supply.

All along the Seaboard industries are steadily increasing. Southerners themselves are putting money into numerous cotton factories, and the young men are educating themselves to take practical charge by serving a term as hands in the mills. Outsiders are also making investments. Silk mills have been established at Roanoke Rapids and Weldon, where there were already large cotton mills. Over 100 roller flour mills have been established along the line of the road within the past twelve months, supplying flour for the home market and stimulating the raising of grain by local farmers. Canning industries have also been established at numerous points. At Pine Bluff, where water-power has been developed, twelve shoemakers from Lynn, Mass., will try the experiment of establishing a co-operative shoe factory. At Sanford and Carthage woodworking and furniture factories have been very successfully started during the past year. These are indications of some fields that exist. Others, in the language of advertisements, are "too numerous to mention."

Outside of St. Augustine, the blessed, which is reached by solid trains from New York over the Seaboard, there are numerous resorts along the road which are steadily growing in popularity. The sand hills of North Carolina, with their ozone-laden atmosphere and grateful odors of pine, furnish conditions attractive to the icebound denizens of the North, and a number of important resort towns have been built up in that section. Southern Pines was the pioneer, and now its hotel and boarding-house capacity of 3000 guests is taxed each winter. Pinehurst, the splendid enterprise of the late James W. Tufts of Boston, is a model city in the woods, with electric-car lines, lights, sewerage and the largest and best-equipped hotel in North Carolina. In this beautiful haven of rest there is a winter colony of 2000 outside the hotel guests, and most of the charmed visitors return there year by year. Pine Bluff, where 100 houses are each year occupied by Northern visitors, is another in this group of much-prized resorts, and a little further down, Camden, across the South Carolina line, comes in for a share of popularity of the same design. And to the enterprise of the Seaboard Air Line the development of these pleasant places, as well as of the other rich resources of the vastly-diversified territory along its line, is largely due.

A Strong Bank and a Great Bank Building

Magnificent is the word to describe the new home of the old, reliable Citizens' Bank of Norfolk, Va., for the beautiful building, located in the heart of the business part of the city, would do credit to even the metropolis of the nation. Built in the best style of architecture, from plans by Charles E. Cassell of Baltimore, it is pointed to with pride by the citizens of Norfolk, and is an admitted credit to the city it adorns. Seven stories in height at present, all above the first floor being rented out as offices, so great is the demand for quarters in the building that three more stories have been designed, and will be added without delay. Fireproof in construction, and with two elevators in service, it meets all the requirements of those accustomed to the conveniences of the most modern office building.

The entire first floor and basement are used by the bank for offices and vaults. The interior of the bank is beautiful to a degree. Chaste Corinthian columns loom above the fretwork, which gives seclusion and safety to each department of the bank, while the wainscoting is of the rich sienna marble, which was chosen by the builders of the unsurpassed Congressional Library in Washington and the great cathedral at Milan.

In the directors' room is some of the handsomest wood carving to be found in any banking house, and the massive oak finish here is admired by every visitor. The beautiful mechanism of the great safe, with its fine time-lock, is likewise he object of admiring inspection on the part of all who are admitted "behind the scenes."

The Citizens' Bank was organized in May, 1867, with Richard Taylor as president and W. W. Chamberlaine as cashier, and these were the directors: R. H. Chamberlaine, W. W. Sharp, C. W. Grandy, D. D. Simmons, Wm. H. Peters, G. W. Rowland, G. K. Goodridge, R. C. Taylor, Richard Walke, Jr., and Richard Taylor, all leading business men.

The bank started with a paid-up capital of $50,000, and, having the confidence of the community, at once commanded a large share of public patronage.

In 1872 President Taylor resigned to become president of another bank, and was succeeded by Mr. Richard H. Chamberlaine, who died in office, in July, 1879. Mr. Wm. H. Peters succeeded Mr. Chamberlaine, and continued as president of the bank until his retirement from active business, about eighteen months ago.

In January, 1877, Mr. Walter H. Doyle was elected assistant cashier, and in 1879 became cashier, Mr. W. W. Chamberlaine having resigned to become treasurer of the Seaboard & Roanoke Railroad. Mr. Doyle occupied the position continuously until his election to the presidency on the retirement of Mr. Peters.

In July, 1885, the capital was increased to $100,000, $40,000 of which was capitalized from the surplus fund, and the remaining $10,000 was paid in by the stockholders. In July, 1889, the capital was further increased to $200,000, $50,000 coming out of the surplus fund and $50,000 allotted to desirable depositors, not stockholders. In October, 1891, the capital stock of the bank was again increased to its present capital of $300,000. The increase was allotted to and taken by the stockholders.

The dividends declared since the organization of the bank in May, 1867, aggregate $456,185.50, being 452 per cent., or 14 per cent. per annum. The surplus fund and undivided profits have steadily accumulated, and aggregate today $240,000, notwithstanding the liberal dividends declared, and never was the business of the bank in a more satisfactory condition than at the present time. Those who are now, or have heretofore been, associated with the Citizens' Bank take pride in the position it has uniformly maintained, and can justly claim it has, at all times, discharged its duty to the public and its stockholders.

The bank officers at present are Walter H. Doyle, president; John W. Perry, vice-president; Tench F. Tilghman, cashier; directors, J. W. Perry, McD. L. Wrenn, G. M. Serpell, John Twohey, John N. Williams, Geo. C. Reid, George A. Schmeltz, C. D. Kenny, W. H. Doyle and T. F. Tilghman.

These are well-known business men, with large private interests, and are connected with almost every movement for the betterment and development of the trade, manufacturing and shipping of this port. In business they are energetic and enterprising; in calculating results, careful and conservative. The organization of the bank is superb. It is a perfect financial machine, thoroughly alive and up-to-date.

The bank is authorized by law to act as executor, administrator, guardian, assignee, receiver, trustee and agent. It assumes the whole management of estates, real and personal, attending to the investment of funds, the collection of rents, the payment of taxes, the insurance of property, etc. It is a legal depository for court and trust funds, as well as for building associations and corporations. It buys and sells municipal and county bonds, and loans money on first mortgages and collateral security. It acts as surety on the bonds of executors, administrators and guardians throughout the State. It accepts deposits, which may be withdrawn on notice or at a fixed date previously agreed on, and allows interest on them.

The bank building has every modern convenience—handsome coupon and meeting rooms for individuals and boards of trustees or directors, in which business can be transacted in privacy, with separate apartments for women.

Unsurpassed facilities for the storage of valuables, such as jewelry, silverware, paintings, statuary, books, papers, family plate, heirlooms, keepsakes, etc., are provided. Trunks, boxes and packages containing plate, jewelry and other valuable articles are received for safe-keeping under guarantee, the company assuming full and absolute liability for their redelivery.

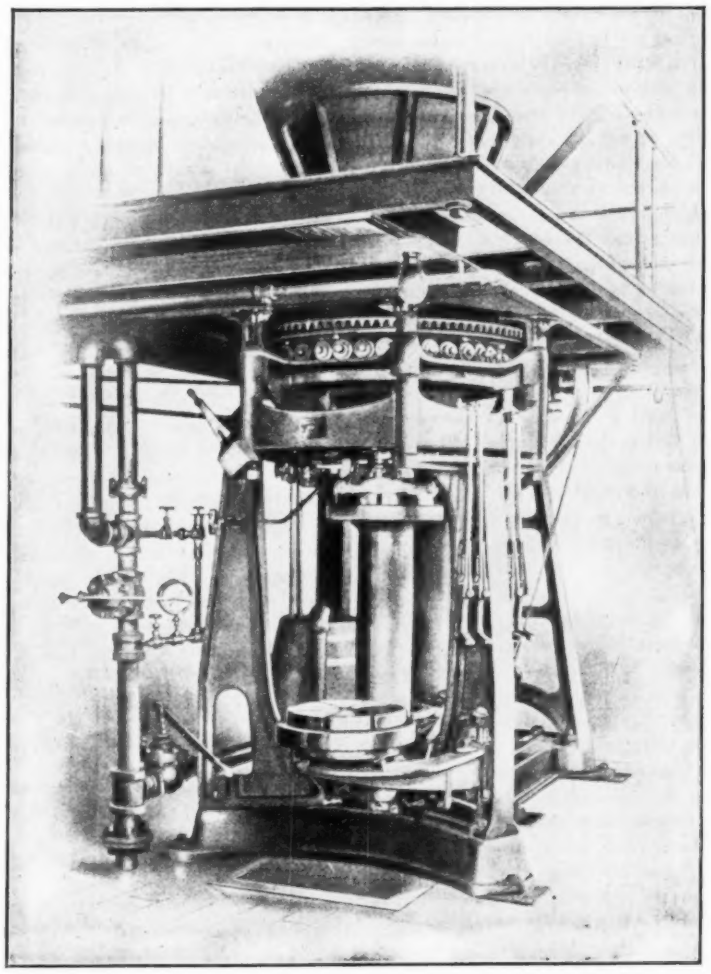
Safes or vaults are rented in various sizes to suit the needs of customers; large safes are provided for bankers, building associations and others requiring unusual space. The schedule of prices ranges from $5 a year upward. All of the most modern scientific and mechanical appliances are in use, making the vaults absolutely fireproof, waterproof and burglar-proof. The vaults might be submerged without any injury to their contents. The vaults were built by the Hall Safe Co. of Cincinnati according to the plans and under the direction of the Hollar Lock Inspection & Guaranty Co. of Philadelphia and New York.

The Lowry Compress and What it Has Accomplished

As a commercial machine the Lowry compress is three years old. It is barely five years since the first general ideas of the inventor, Mr. George A. Lowry, began to take shape in a mechanical form. As the principles involved were entirely novel, and the application of them to commercial practice required an immense amount of thought and experimenting, the fact that today the Lowry compress is universally acknowledged to be one of the great machines of the world is little less than wonderful. Only genius backed by abundant capital and enthusiastic confidence on the part of men of wealth and business ability could have produced such results in so short a time.

The inventor who can show a way to save a material part of the expense in handling and transporting many of the chief commodities of commerce is a public benefactor just as certainly as the great statesman or the great philanthropist. Reduced to its simplest and most general terms, the commerce of the world consists in two great operations—first, the production of the things which the human race requires for its sustenance, comfort and pleasure, and second, the conveying of these things when produced to the communities and individuals who require them. From the beginning of history the greater part of the energies of mankind have been devoted to these two operations, and it would be difficult to say which is more essential to the well-being of the world. The producer, to be sure, has always been of the opinion that his work is the nobler and more essential, and the greater reward should accrue to him, but nothing is clearer than the helplessness of the producer when deprived of the services of the conveyor and distributer of the result of his production. A moment's reflection will show that without the extraordinary development of the means of conveying and distributing commodities, which is, perhaps, the chief glory of our time, the whole character and method of modern production would be impossible. It is the comparative perfection reached by railroads and steamships that has enabled the producer of every kind of commodity in our day to avail himself of all natural advantages of location and opportunity wherever they may disclose themselves in the whole wide world, and so to produce more abundantly and more economically than has ever been the case before in human history. The result has been a vast gain to humanity, in that for the greater part of mankind the pressure of want of essential, yet unattainable, commodities has been permanently done away. The progress of civilization is marked by the incessant efforts of producers of commodities to produce them at less cost (which means with less expenditure of human effort), and by the incessant efforts of the conveyors and distributers of these commodities to perform their task with a similar economy. The price of every imperfection, whether in production or in transportation, is additional human toil to produce the required result, or, to state it in another way, a given amount of human toil imperfectly applied produces a less result, and consequently obtains a less remuneration. There is no escape from the eternal law of nature that the better a thing is done the more the doer profits, and the less well a thing is done the less the doer gets.

As has already been said, the efforts of the conveyors and distributers of commodities to perfect their methods have already had marvelous results, and have permanently affected the production of these commodities all over the globe. One of the most wonderful features of modern commerce is the way in which almost the entire bulk of the agricultural products of great areas, tilled by millions of producers, is conveyed from one side of the world to the other and delivered to those who cannot economically produce them, but yet can utilize them to the best advantage. The feat annually performed of transporting 80 per cent. of the cotton crop of the Southern States from the farms where it is grown to the mills in New England or abroad, thousands of miles away, is so remarkable that were it not usual it would fill the world with astonishment. The aggregate bulk of all the farm products thus transported, if it could be realized, would outstrip even the most vivid imagination, and all this is the direct outcome of the efforts of the transportation and distributing agencies to perfect their methods and appliances. Indeed, in the face of all that these agencies have accomplished, it is hard to remember that the rule still holds true that a price must be paid for whatever remains imperfect and uneconomical, and that the higher the cost of the service of transportation and distribution the less is the profits to both the producer and consumer of every commodity.



Even a superficial acquaintance with the elements of cost of transporting commodities in general, and farm products in particular, reveals the fact that there still remain very serious defects in the general practices of trade. A peculiarity of the majority of the products of agriculture is their excessive bulk as compared with their weight. Now, excessive bulk is the worst of all defects from the point of view of economic transportation, whether by land or by sea, yet many of the chief farm products of the world have this characteristic to a peculiar degree. Such are cotton, wool, hay, straw, corn-stover, flax, hemp, jute, sisal, esparto, and, in fact, any and all products of a fibrous nature. It follows, then, that any invention which makes it possible to reduce the bulk of these commodities as compared with their weight is a positive benefaction to the world. It saves expense in transportation and handling, and this means that both producer and consumer benefit. The force of this remark has been recognized for an indefinite period, and everybody knows what elaborate devices have been employed, even at an apparently enormous expense, in order to get fibrous materials into a small enough bulk to be handled and transported at all. The money invested from one end of the world to another in presses and compresses reaches an enormous sum, and the expense entailed in the operation of these machines is one of the great taxes upon commerce.

The remarkable character of the Lowry compress as a machine consists in the fact that it is today by general consent the best machine in the world for economically handling these commodities, at the same time that it produces a package with a density and uniformity far greater than have ever been obtained before. When Mr. Lowry conceived the idea that the only sound theory in machinery of this character was the theory of compressing materials a little at a time instead of in large masses he hit upon what seems to be an exceedingly simple and obvious principle, but what as a matter of fact nobody else had ever thought of. The results obtained by putting this principle into practice have shown that any other type of machine is hopelessly crude and unscientific, and there can be no reasonable doubt that within a very moderate period of time the Lowry compress will be adopted from one end of the world to another as embodying the only scientific method of mechanical treatment of fibrous materials for transportation purposes.

It is a familiar fact in the history of inventions that machines involving a departure from the rule-of-thumb methods commonly current have at first to contend with all kinds of obstacles. It is curious how many people find a way to derive profit for themselves from the very imperfections of commercial practice. The force of all these people is, of course, thrown in opposition to any improved method which deprives them of their opportunity for private gain, but the good of the majority is bound to prevail in the long run, and any man who is striving against the improvement of methods is like the old woman keeping back the sea with her broom. In the long run the sea always has the best of it, and the old woman has to ride off on her broom or else be submerged.

When the Lowry compress was first introduced in the season of 1899 in the ginneries of the South there was a universal outcry from the compress men, who saw their antiquated method threatened with destruction; from the cotton exporters, who were making profits on the sly from the patching of ragged square bales, from the absorption of moisture, due to stowage in damp places, and so on; from the stevedores, who were paid exorbitant wages for screwing square cotton into ships, and from a multitude of other persons whose immediate livelihood depended upon the imperfections of the ordinary square bale. All kinds of ridiculous objections were raised against the introduction of the new machine, and both by direct and indirect means it was sought to stifle it in its infancy. But the Lowry compress could not be stifled. It embodied principles too sound to be successfully withstood by these methods. As soon as Lowry cotton began to be turned out in considerable quantities it became clear that persons much more numerous and of much more consequence than those mentioned could find a profit to themselves from the use of the machine. The cotton producer began to find that he was getting more money for his cotton when he had it put up in Lowry bales. The railroads found that where they had been accustomed to haul 12,500 pounds of uncompressed cotton and 25,000 pounds of compressed cotton in a car, they hauled 60,000 pounds of Lowry cotton in the same car, and were saved all the expense of concentrating of cotton at a compress. The steamship people discovered that they could load 50 per cent. more cotton in their ships, and that the expense of loading it was less than one-third the expense of screwing in square cotton. The insurance people found that the Lowry bale was, from their point of view, far more desirable than the square bale. Finally, the spin-

ners who used the Lowry bales in their mills had it brought home to them that they had not been deriving any great advantage from the patching which the square-bale exporters had been selling to them as cotton, nor from the moisture which had been absorbed by the square bale, nor from the dirt which had been ground into the exposed and ragged cotton on its surface. Having had a trial of the Lowry bale, all these great classes of interested parties wanted more of it, and in spite of the louder and louder clamor against it, the demands for this improved form of package have been so insistent that there can now be no doubt that the Lowry bale of cotton is rapidly coming to be the recognized ideal which must as surely supersede the barbarous square bale as the cotton gin superseded the method of hand ginning. A very characteristic illustration of the inevitableness of this change is a statement recently made by one of the most prominent railroad men in the country, President E. P. Ripley of the Atcheson, Topeka & Santa Fe Railroad. Having been accused of fostering the Lowry bale by illegitimate means, President Ripley emphatically denied the charge in an interview published in the Galveston News of December 15, 1901, but then went on to speak as follows:

"* * * I know but little about the round-bale controversy which seems to be raging in this State, and that little is largely derived from what I have read in the Texas paper. I do know, however, that from a railroad standpoint the round bale is a most desirable package; that its use will enable us to handle the crop with much less equipment and with much less expense for handling. For that reason only we have encouraged the round-bale people to locate plants on our line. This encouragement has taken the form of providing locations and furnishing sidetracks, but has stopped there.

"I realize that much money is invested in the old-style compresses, and have no desire to injure those who are interested in that business. But from a transportation point of view the advantages of the round bale are so obvious as to need no further elucidation. Whether or not the round bale is desirable from the standpoint of the spinner or manufacturer of cotton goods I cannot say. But if it is advantageous to these interests, I cannot see why it is not destined to come into universal use, since it is such an enormous improvement in the way of economical handling. * * *"

What President Ripley, as a representative of the railroad interests, has so emphatically stated is paralleled by repeated statements from representatives of all the other interests vitally connected with the production and use of cotton. No amount of disingenuous argument can destroy the effect of sledge-hammer utterances like this, and President Ripley was speaking not theoretically, but from actual experience. The Gulf, Colorado & Santa Fe Railroad had actual figures showing that the average carload of compressed square cotton on its line was 26,315 pounds; the average revenue per car from Texas common points to Houston, $140.53; the average revenue per car per mile, 45.7 cents, and the average number of days in transit from the compress to Houston, 9.2 (to which must be added, of course, the time required for twice the number of cars to concentrate the cotton from the initial point to the compress). The same road found that the average weight of Lowry bales per car was 48,008 pounds, the average revenue per car $265.79, and the average revenue per car per mile 78.9 cents, while the average number of days in transit from the initial point to Houston was only eight. The saving of expense to a railroad on a season's cotton business, if it all moved in Lowry bales, would obviously be enormous, and any up-to-date railroad man could not fail to throw his influence as strongly as possible in the direction of getting cotton into Lowry bales in order that his road might experience the benefit. The triumph of the Lowry bale of cotton in the near future is absolutely assured. It meets the needs of those who have it in their power to dictate how cotton shall be put up for shipment, i. e., the farmer, who gets more money for his crop in Lowry bales than in square bales; the transportation agencies, who can handle the Lowry bale with vastly less expense, and the spinners, who get their cotton cheaper and in better condition. All the efforts of the middlemen and scavengers of commerce cannot withstand the pressure of these vitally-interested parties.

But the Lowry compress is not only revolutionizing the handling of cotton; it is doing the same thing for the great forage crops of the country—hay, alfalfa, cornstover, straw, etc. In proportion to their value, no commodities cost so much to transport as these when handled in the prevailing way. A carload of hay weighing only 20,000 pounds, when the car is capable of carrying 60,000 pounds, is highly uneconomical and inevitably means a high freight rate. Again, for ocean shipment, a ton in weight of hay measuring 140 to 160 cubic feet is about the most undesirable cargo a ship can have. On the other hand, Lowry bales of forage are shipped in carloads of 60,000 pounds and over, and when stowed in a ship's hold a ton of Lowry hay occupies only fifty to sixty cubic feet, and is as desirable cargo as grain. The introduction of the Lowry process has developed the export trade in forage to a wonderful extent in the last two years. Many thousands of tons are now being shipped monthly from the Atlantic ports to Europe and South Africa, and from the Pacific ports to the Philippines, China and Alaska. It is needless to call attention to the benefits accruing to the farmers of the country from this opening up of foreign markets for a commodity raised in such abundance, but hitherto available only for home consumption.

The wonders of the Lowry compress do not end with cotton and forage. It is baling sisal in Yucatan, wool in the West, scrap tin in Pennsylvania, pine straw in Georgia. It will soon be baling hemp in the Philippines, esparto in North Africa, jute in India, alfalfa in Chile and Argentine, rags in Italy and Japan, wood pulp in Canada and Maine. Wherever there are fibrous materials to be put in shape to transport long distances there the Lowry compress is being called for as the only machine operating on really scientific principles and producing ideal results. Truly it may be said that few human inventions have produced such widespread and revolutionary changes in the commerce of the world.

HOUSTON AND SOUTH TEXAS.

Their Advantages as Viewed by Bryant-McEnnis Land Co. of Houston.

With her fourteen lines of railroad, deep-water channel to the Gulf of Mexico, on which the government is now working; cheapest of fuels from the Beaumont oil fields, backed up by forests of choice woods; mountains of iron and other ores, quarries of marble and granite, glass-bearing sands, beds of asphalt, immense salt mine, enormous yield of cotton, large output of rice and sugar, the waste from which makes good paper material, and other raw material found in the territory tributary to her, Houston is destined to be the manufacturing center and seaport of the South.

South Texas contains two-thirds more fine sugar-cane land than the combined Hawaiian Islands, and is the coming rice field of America, there being hundreds of thousands of acres adapted to these most profitable crops, and to cotton, corn, tobacco, fruit, vegetables, etc., and as this land is being sold at very reasonable prices ($10 to $15 per acre), farmers of the North, East and West are being attracted this way, and numbers of them are deserting their old homes in the cold sections of this country and locating in our delightful climate, where they can make more money with less expenditure of cash and labor, and when South Texas has all of its rich lands in cultivation there will be no wealthier section of country in the world.

Hundreds of thousands of dollars are now being expended in the construction of rice canals and irrigating plants and other enterprises, and numerous other similar projects are awaiting capital to develop them; in fact, we are in position to loan out millions of dollars for development purposes at considerably higher rate of interest than capital is securing elsewhere, and on ironclad security, in which connection it may be said that we have issued a pamphlet entitled "Alien Land Laws of Texas," a copy of which, and other literature, we will send if you are interested.

If you want to loan your money at a handsome rate of interest, if you want to buy rice and cane land which will easily double in value within a year or two, if you want an oil gusher, iron or salt mine, or want to organize a stock company for any purpose, or are in any way interested in Texas, we will cheerfully furnish any information desired.

We refer to any bank or firm in our city.

BRYANT-MCENNIS LAND CO.,
No. 1015 Moore-Burnett Bldg.,
Houston, Texas.

FIREPROOF PAINT.

The Success of Lythite in Preventing Fires.

Mill men and manufacturers are manifesting an increasing interest in Lythite, a cold-water fireproof paint made by Frank S. De Ronde Company of New York, and which is claimed by many to be the best absolutely fireproof paint which can be used. The De Ronde Company has issued a very interesting booklet containing fac-similes of original letters of recommendation from prominent firms all over the country, in which the excellences of Lythite are testified to in the most unqualified terms. For the benefit of those who have yet to learn of the superior qualities of Lythite, it may be stated that it is a dry powder, which, when mixed with cold water, produces a perfect liquid paint, suitable for both interior and exterior work. It is made in pure white and twenty-four colors. It is regarded in especially high favor for use in factories, mills, large plants and buildings of all kinds on account of the extreme whiteness of the paint and the hard, firm, fireproof surface, which increases the light, keeps the walls and ceilings in a clean, healthy, sanitary condition, and renders them absolutely fireproof.

The interesting book of testimonials referred to contains a number of most significant statements. One, from the Gonzales Fish & Oyster Co. of Mobile, tells how $30 worth of the paint saved a $10,000 office building from destruction. In a conflagration which destroyed several buildings on each side of the Ganzales building, the heat even drew the resin out of the pine, but on account of the Lythite the paint prevented the lumber from igniting.

Lumber companies, iron works, cotton mills, distilleries, packing companies and many others testify to the entire satisfaction which has followed the use of the paint, and every expression is to the effect that Lythite is superior to anything that may be used for either interior or exterior application. One customer in Massachusetts states that the paint is used to cover the plaster of the house throughout, and that better results have been secured with the application of two coats of Lythite than could have been expected from one coat of varnish and two or three coats of lead.

All of the testimonials are of the same tenor, giving in the strongest possible terms an unqualified endorsement of the paint in all cases where either a firm, hard paint is desired or where whitewash or calcimining might be employed.

Southern Electrical Supply Co.

Intelligent planning and supervision of the installation of electrical machinery is fast becoming appreciated throughout the South. The demand for equipment of this sort is rapidly extending, and much loss can often be avoided by engaging experienced men. It is to meet this want that the Southern Electrical Supply Co. of Norfolk, Va., aims. The record of this concern indicates its success in this respect. It was started in Baltimore in April, 1896, and in August of the following year opened an office at Norfolk to better care for the then rapidly-increasing electrical development in the South. In February, 1900, it sold out its Baltimore business, and has since been occupied in supplying the Southern trade from Norfolk. Last September the business was incorporated as the Southern Electrical Supply Co., with enlarged facilities. The business of the Zamoiski-Palmer Company was bought out by Mr. A. N. Palmer in 1898 and carried into the Southern Electrical Supply Co., of which Mr. Palmer is president.

The accumulated experience and business prestige brought to the company as it now stands by these changes gave a wider scope to its operations. It was found that the active spirit leading Southern industrial development needed the same celerity in executing contracts that was so helpful in other sections. This caused the company to arrange to carry in stock, ready for urgent calls, equipment and machinery for electric-light plants, central stations, trolley lines, telephone exchanges and other enterprises that required electrical outfitting. It is operating through the various Southern States because of this preparedness to fill requirements. The company has a corps of experts. Besides Mr. Palmer, another man of experience is the treasurer, Mr. James L. Belote. The latter was superintendent of the Virginia Electric Light Co. at Norfolk, Va., for seventeen years. In August last he resigned to go with this company. Mr. Belote is well known in electrical circles as a specialist upon the equipment of central stations.

A New $1,000,000 Dry Goods and Notion House

The Lloyd L. Jackson Company and Its Wide Operations

In no branch of trade is the city of Baltimore, with its widely ramifying commercial interests, stronger than in the wholesale dry goods business. As a matter of fact, its leadership in this line of trade has made the city famous. The output of dry goods each year from this city is phenomenal. That the great volume of business is not only maintained, but is steadily establishing new records, is the striking feature of this business. Manufacturers at home and abroad have their fashions molded by the demands of the Baltimore market. It is safe to say that more successful specialties owe their creation to the demands of this market than to any other influence. In this respect Baltimore is truly cosmopolitan. The variety of wants that come to this dry goods center range from the staid old-fashioned to the very newest fad. So extensive is the volume of business and so broad is its distribution that many experienced manufacturers feel the pulse of the Baltimore trade before making any important departure in their products.

With such a prestige it is not surprising that the momentum of trade swinging towards this center has caused the organization of such a concern as The Lloyd L. Jackson Company. This corporation is composed of men who have made a life-study of the dry goods trade in all its branches. Some have been for years in Baltimore houses of well-known reputation; others have come from leading firms in the North, South and West, prompted to unite their capital and experience in this new company because of the realization that Baltimore afforded the largest opportunities for a broadly national organization that would measure up in resources to the requirements of the times. From a city where such a huge volume of dry goods business is handled it is expected to find a house of the twentieth-century type, with all this implies in amplitude of capital and wealth of experience.

The organization of this company has given a distinct impetus to the wholesale dry goods trade of Baltimore, and has ushered in an epoch of larger growth in every detail of this business. To the thousands of dealers scattered through the South and West and in the East who recognize that buying in the best markets is the most important step to quicken their own sales, this event is of real personal interest. It confirms the reputation Baltimore has achieved, and disposes of any doubt as to where the most diversified and up-to-date products can be found.

As the executive head of this company has been a powerful factor in developing the city's trade, and has been the chief spirit in forming this new company, something about his personality will be of interest. Gen. Lloyd L. Jackson is one of Maryland's first citizens. He is a leader not only in a business sense, but in the broader things that have to do with civic progress. Had he not been wedded to business the appreciation of the people would have long ago tendered him high office. No important public movement, especially those that stand for advancement, has been undertaken without an invitation to him to help in setting the pace. He is now filling his third term as president of the Merchants and Manufacturers' Association, which is a body of aggressive men representing millions of capital and thousands of employes. This association is more than a local body, and the weight of its influence has secured many important advantages for the commercial interests of the country, notably in a transportation way and from Congress.

The merchants of the South have particularly benefited from a number of these, and during his administration as head of the Merchants and Manufacturers' Association the extension of the stop-over privilege and the securing of cheaper transportation to merchants have been conspicuous in the work it has done for the general commercial interests of that section. Gen. Lloyd L. Jackson is also identified with large financial interests that center in Baltimore. Chief among these is the Maryland Trust Co., of which he is vice-president. This company's operations are international in their scope, as evidenced by the fact that it has lately financed a plan to give the city of London a typical American rapid-transit service. Through this company General Jackson is also brought into close touch with the industrial progress of the South, as it has been of splendid service in securing the investment of capital for this purpose.

Although holding responsible public and financial positions, it is in his own business that the greater ambition and energies of General Jackson are fixed. With thirty-five years' experience in the wholesale dry goods trade, he has accumulated a knowledge that is not only useful to his own company, but of especial benefit to its patrons. Few men are as well informed about market conditions, and fewer still have the judgment broad enough to direct the operations of a company which it is roughly estimated will do a business of $6,000,000 during its first year. Thoroughly grounded in every detail of his business, he built up his company upon a solid basis. The high character of the personnel will at once give assurance that the nine grand departments into which this company has divided its operations embrace the best available knowledge. This, of course, lends value to the products handled, as they represent the selections of those who have been well trained.

Recently the company opened an office in Pittsburg, Pa., in the Renshaw Building, 9th and Liberty streets. Here full lines are on exhibition in Pittsburg at all times, embracing a variety of assortments both in dry goods and notions, and including white goods, linens, dress goods, wash fabrics, draperies, linings, blankets, quilts, flannels, hosiery, underwear, gloves, laces, embroideries, handkerchiefs, shirts, overalls, ladies' skirts, high-class novelties and small wares.

Messrs. Theodore T. Sansbury, O. H. Price and Florence Spamer are resident salesmen connected with the Pittsburg office.

The company has also established offices at Atlanta, Ga., in the Gould Building, and at 395 Broadway, New York, corner Walker street.

Such a corporation as the above details have shown must necessarily have large financial backing. In this feature the company is strong and has a paid-in capital of $1,000,000. Its officers are: President, Gen. Lloyd L. Jackson; first vice-president, I. Manning Parsons; second vice-president, J. Hurst Purnell; treasurer, Joseph W. Crook; secretary, Albert Diggs. The directors of the company are Lloyd L. Jackson, D. F. McMullen, I. Manning Parsons, Frederick D. Miller, J. Hurst Purnell, Florence W. MacCarthy, Isaac Newton Todd, John Kern, D'Arcy P. Bryan, George Turner, N. Winslow Williams, Joseph W. Crook, Robeson Lea Low, Henry H. Bantz, William A. Lewin.

The location of the company is at present at 23 and 25 Hanover street, but it will, about July 1 of this year, occupy the magnificent new warehouse shown in the accompanying cut. This building will be one of the largest and most perfectly-appointed structures in the country. It was designed and is being built especially for the business of the Lloyd L. Jackson Company.

L. L. JACKSON COMPANY'S NEW BUILDING

DIVERSIFYING IN COTTON

Plans of a Manufacturing Company of Charleston

[Special Cor. Manufacturers' Record.]

Charleston, S. C., February 8.

It is in the side-lines of the cotton-manufacturing business that there is just now the greatest opening. Mill after mill has been erected to manufacture yarns and cloth goods. There are comparatively few mills that devote their energies entirely to the manufactured product. There is today what is claimed to be the largest seamless-bag factory in the country in the city of Charleston.

It has been stated that a cotton-mill plant could not pay in Charleston. That this was idle talk has been amply proven by the remarkable success of the Royal Bag Manufacturing Co. It is not so much of a wonder that the enterprise has been a great success when it is known that Mr. George A. Wagener has been the president of the company, and that he has put competent men like Mr. George Lunz in charge, and that he constantly keeps his hands on the lever.

The Royal Bag Manufacturing Co. started business on a small scale in Hayne street in 1889. Then the company had a capital stock of $30,000, and that was increased first to $50,000 and later on to $75,000. Never was there a failure to pay a good dividend, and so successful was the enterprise, and so persistent and healthy the demand for the product of the factory, that there was not the slightest trouble to organize and build the Royal Bag & Yarn Manufacturing Co. The latter company is the outgrowth of the original Royal Company, but it is a separate and distinct corporation. The present purpose is to continue the Royal Bag Manufacturing Co. in Hayne street and turn out jute and cotton bags to the full capacity of the plant, which is about 10,000,000 bags a year. The new company has erected the most complete and thoroughly-equipped bag factory in the country. Everything about the plant is new and up-to-date. A brick building three stories in height and 100 feet wide and 244 feet long was especially erected for the new plant under the direction of the D. A. Tompkins Company of Charlotte. The power plant is in an annex. The new plant has been located on a beautiful 15-acre tract just on the edge of the city and in the city limits. It is on the line of the street and steam cars and is immediately opposite the exposition grounds. The company is erecting a series of neat homes for the operatives. The scheme is to build homes better than the average of those offered operatives.

The management has not saved at the spigot to lose at the bunghole, and only the latest and best machinery and equipment have been bought. The bag factory will start out with an equipment of 10,000 spindles and 200 looms. The looms are what are known as the Crompton-Knowles seamless-bag looms, and turn out a perfect and seamless bag, and the only sewing that is necessary is of the top after the bag is filled and ready to be closed up.

The Royal Bag & Yarn Manufacturing Co. expects to turn out the finished product, and the cotton will go into the factory at one entrance, and out of the other will be sent bags for flour, salt, sugar, seed, money, fertilizers or anything else that is to be put up in that style of package.

The cotton is to be spun into yarns, and the yarns are then to be woven into the cloth bags; then the bags are to be printed and finished. If the bags are to be printed, the factory is equipped with a complete printing outfit. Presses using as many as six colors are installed, and the company has its own stereotyping and electrotyping plant in the building. If colored work is wanted, the company has its own dye plant.

The Royal Company is also equipped for the manufacture of all grades of yarns, and especial attention is to be paid to the twine department, and in addition to manufacturing all of the twine needed for the bags, a large product will be offered on the market.

The Royal Bag folks now have a national demand for their products, and while the new plant will manufacture from start to finish the cotton bags, the manufacture of the jute bags, necessary for the fertilizer and other trades, will be continued and enlarged. The Royal people have worked up their business because they have given the trade exactly what was wanted, and there has been no trouble in disposing of 10,000,000 bags a year, and there will be no more difficulty in disposing of the additional 20,000,000 seamless bags that will be put on the market.

The Royal Company has no selling agents, and it handles its own product, and in that way makes a respectable dividend in dispensing with a middleman for the sale of its products.

Some of the goods are sold through brokers, but on these sales a small brokerage is allowed on actual sales. The bags now made go all over the United States, one of the largest flour manufacturers being a heavy customer of the company. It is the hope of the management to develop a considerable West Indian business.

The labor question might be thought to offer some little trouble. The plant will start out with about 350 operatives, and applications have already been received from fully three times that many operatives, and no difficulty whatever is anticipated in getting all the desired help. The pay will generally be on the "piece-work" basis, and the operatives will earn fully as much as is possible in any other mill.

The factory has its own electric plant, and is constructed in absolute compliance with the association's requirements as to fire protection. The company has its own warehouses, also built upon the requirements of the insurance companies. The mill is heated and cooled by the Sturtevant system.

The officers of the company are: George A. Wagener, president; James M. Seiginous, vice-president; George Lunz, secretary and treasurer; George A. Wagener, F. W. Wagener, C. H. Drayton, James M. Seiginous, directors.

The expectation was to have the plant in operation by this time, but the steel strikes delayed the work somewhat, and the present purpose now is to start the new and splendid plant about the middle of February. AUGUST KOHN.

THE ROYAL BAG AND YARN MANUFACTURING CO., CHARLESTON, S. C.
THE D. A. TOMPKINS CO., ENGINEERS, CHARLOTTE, N. C.
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WASHINGTON, N. C.

What Is Offered in the Pamlico Section of This State.

A striking array of advantages confronts the homeseeker who visits the delightful Pamlico section of North Carolina, that makes its most attractive display in and around the bustling town of Washington, in Beaufort county. Sticking closely to demonstrable facts will paint a more glowing picture than the most imaginative pen in describing this locality. One could approach the study of this section to determine its availability as a healthy home for those not endowed with a vigorous constitution and find satisfying results. Under comparison as a location for a man with a moderate competency and an appreciation of what nature affords in an equable climate for the fullest enjoyment of life, it would afford an ideal selection. To one who looks to the soil for profitable occupation there are manifold opportunities. The position of the town as a distributing point is worth serious attention from business men and manufacturers.

The climate of this section is salubrious. Its average temperature is 61 degrees Fahrenheit, as follows: Spring, 58 degrees; summer, 77 degrees; autumn, 62 degrees; winter, 45 degrees. The rainfall shows an average precipitation of 55.23 inches, as follows: Spring, 12.85; summer, 17.04; autumn, 13.10; winter, 12.24. Notwithstanding this rainfall, the humidity tables show a comparatively dry climate, which dryness of the atmosphere, as elsewhere in the long-leaf pine lands in North Carolina, is found to be decidedly favorable to health and longevity, and especially so to the prevention of and recovery from consumption and similar diseases which develop in more rigorous climates. The death-rate in this section is actually less than the average for North Carolina, which is 11.38 per 1000. This is lower than the average for the United States.

There are no extremes of heat or cold. Protected by the Appalachian range on the west and warmed by the Gulf Stream on the east, the winters are tempered, while the salt sea breeze dissipates the sultry heat of summer, giving such ideal conditions that many of the products of a semi-tropical and temperate clime grow side by side in luxuriant profusion. Here in their native home the grape, the pear and the berry are to be found in perfection. The soil is peculiarly adapted to the growing of the strawberry, and the earliness of the climate makes the crop of especial value for Northern shipment. Strawberries are often found in abundant supply here in the middle of July from fields which sent the first fruit to market early in April. With seasons a few weeks earlier than Norfolk and but little later than Charleston, the growing of vegetables for the Northern market is becoming an immense industry. The farmer and trucker finds that here two, and often three, crops can be easily raised in one year on the same land. Accessibility to market, long seasons and practical immunity from disastrous frosts are other important advantages.

The mild winters permit outdoor work throughout the entire year. There are not many small farms for sale, and the small farmers are generally independent and prosperous; but the large plantations are being subdivided, and good lands can be bought cheaply from $3 to $30 per acre.

Washington is a rapidly-growing town of 6500 inhabitants, situated on a beautiful eminence overlooking the Pamlico river, an arm of Pamlico sound, at the head of deep-water navigation. Its facilities for transportation are exceptional. By fast freight it is within eighteen hours of 10,000,000 urban population. It is one of the great lumber towns in North Carolina. Some of the finest fields of tobacco in the country are nearby, and the town is located in the heart of the bright-tobacco-growing section. Its fish and oyster interests give support to thousands of people on the adjacent waters, and is a growing business.

The Chamber of Commerce of Washington, N. C., has collected specific data that will amplify for those who inquire this running review of what is aptly termed the garden spot of the coastal-plain region of North Carolina.

A STRONG AND PROGRESSIVE BANK.

The Norfolk National Bank and Its Long Record of Success.

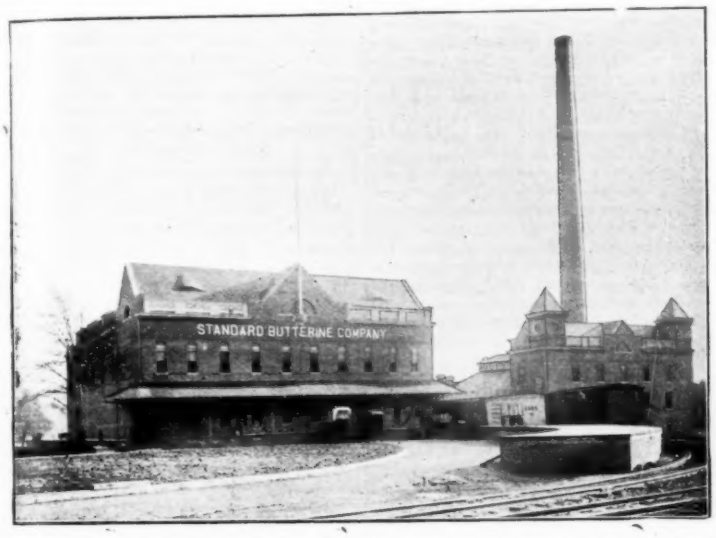
Friends of the Norfolk National Bank take a pride in telling of the uniform and unbroken prosperity which has attended the institution throughout the sixteen years of its existence, and draw from its career a deduction as to the solid financial condition of the city itself. Established in 1885, there never has been a time when the bank was otherwise than sound to the core, and it is some years since its reports first showed it to be not only the leading bank of Norfolk, but one of the largest financial institutions in the State of Virginia. With a capital of $400,000, it has a surplus of $200,000 and undivided profits of over $175,000, while the deposits run to more than $2,500,000. The policy of the bank has always been prudent, while not "hide-bound," and the management is credited with all the liberality and public spirit that is consistent with the safe conduct of a financial institution.

It is not aside the mark to say that much of the success of the Norfolk National Bank is due to the untiring zeal and financial ability of President Caldwell Hardy, who has been with the bank from its foundation. Mr. Hardy's eminence in the banking world was recognized in a very complimentary way recently by his election as vice-president of the American Bankers' Association. He is a North Carolinian by birth, but was educated in New York. Returning South, he engaged in the banking business at Norfolk, and was cashier of the Norfolk National Bank at its beginning. He became president in 1899, and is also president of the Norfolk Bank for Savings and Trusts, an offshoot of the Norfolk National Bank.

Interesting Food Plant

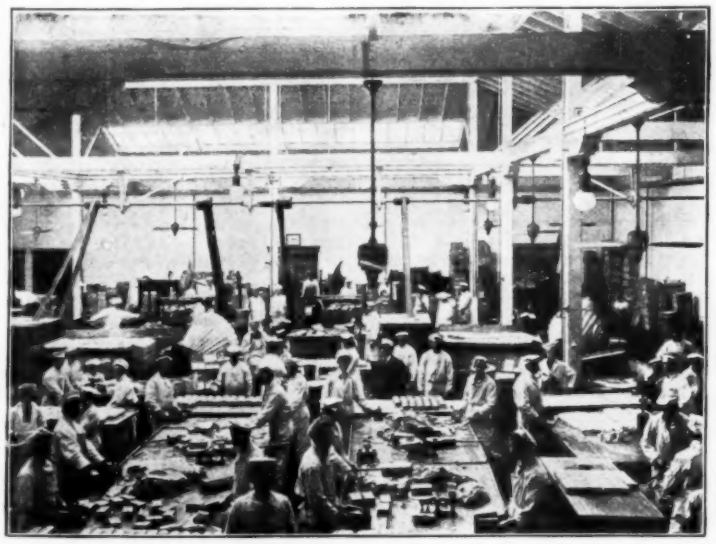
Details of the Butterine Manufacture at Langdon, D. C.

It is worth a visit to the little village of Langdon, D. C., five miles out of Washington on the Baltimore & Ohio, just to find out what a clean, sweet and appetizing thing oleomargarine really is when rightly made, and how erroneous is the popular opinion that the product is necessarily as full of mystery and queer components as the traditional plate of boarding-house hash. From attic to basement of the Standard Butterine Co.'s remarkably interesting plant scrupulous cleanliness everywhere prevails, and the



aroma of the place is as pleasant to the senses as new-mown hay.

The front part of the big three-story brick building is devoted to the offices, where oak finish, sumptuous furnishings, telephones and all modern aids to the dispatch of much business remind one of the offices of some fine bank. A string of cars, part of the company' own line of thirty refrigerator express freights,



is on the siding, loading the finished product for shipment to all parts of the country or unloading the raw material entering into its manufacture, and following down the 600 feet of platform an entrance is found to the factory proper. Materials are elevated to the top story, and work down by gravity, coming out as butterine on the big main floor. Neutral lard, put through a grinding machine, the only one in America and the second in the world, and also oleo oil are worked on the top floor, and on the floor beneath are the milk sterilizers, separators and melting vats. Seeing milk and cream in great quantities, the tyro is informed that the company uses ninety pounds of milk to every 100 pounds of by-product, as the oleo and neutral are called. Cottonseed oil is used in some of the cheap grades.

On the third floor are the "ripening" tanks for milk, the four having 1000 gallons capacity each. There are also twelve cream vats with 1000 pounds capacity each, and it is announced that 600 gallons of cream are used daily. When the cream is duly ripened the ingredients all go into mixing churns, and from that into the immense butter-making churns below; from these the product descends into a cooling vat of iced water. From this it is skimmed or ladled off and carted to one of the seven big butter-working machines, where the salt is worked in and all the water worked out. Then the big masses of beautiful yellow butterine are wheeled over to the print and roll makers, who prepare it for the packers. Immense cooling-rooms hold the product until it is ready to be wheeled across the platform to the refrigerator cars.

There is no buttermilk, so completely has the separating been done. All the water from the factory is drained into a skimming tank some distance from the main building, and from this a small quantity of oily stuff is taken and sold to soapmakers, and probably it is the best test of the general cleanliness of the process that not the slightest odor comes from the barrels of refuse that one finds in this room.

It is said that no more complete plant than this exists in the world, and this is easy to believe after having gone through this wonderfully-equipped factory. There are power plants with dynamos, ice plant, cooling and heating apparatus, and everything possible to add to the cleanliness and economy of the plant's operation. Witness the operation of a laundry, which enables the management to furnish white aprons, coats and caps to the workers every morning.

The Standard Butterine Co. is mostly made up of Washington capitalists, at the head of which is Walter P. Wilkins, the president. Other officers are Harrison Crook, vice-president, and the following directors: Richard A. Johnson, Wilton J. Lambert, Geo. W. Cissel, Richard Young, Henry B. Munn, J. G. Waters and H. P. Pillsbury. The capital stock is $1,000,000, and $500,000 has been put into the plant, which has been in operation but three months. With a superintendent and manager of wide experience in both England and on the Continent, a native of Denmark, named A. Larsen, the highest efficiency has been attained with native labor.

The building of this model factory has given the manufacture of oleomargarine an impetus that is calculated to be felt in all parts of this country, and put the product in a most favorable light before the intelligent public.

Electric Line from Augusta to Aiken

AN IMPORTANT ELECTRIC RAILWAY AND SUBURBAN DEVELOPMENT.

An important development undertaking is announced in the prospectus of the North Augusta Electric & Improvement Co., organized to build an electric railroad between North Augusta and Aiken, S. C., and to carry out the plans and purposes of the North Augusta Land and Development companies. The list of officers and directors shows that the Williams-Middendorf interests of Richmond and Baltimore, who have so largely and successfully of late years engaged in street-railway and other development work in the South, are prominently identified with the undertaking, and that their associates are also men of affairs well known in financial and business circles, North and South. A particularly attractive proposition is furnished by an examination of the assets of the company and the estimates of income. The company, organized under the laws of South Carolina, is capitalized at $1,500,000, one-third of which is preferred stock. Five per cent. 50-year bonds are authorized to the extent of $1,000,000, but it is proposed to offer only $600,000 at the present time, the remaining $400,000 being held by the International Trust Co. of Baltimore, trustee and transfer agent, and only sold for future improvements and developments.

The company has acquired all of the stock and assets of the North Augusta Development Co., and all but about 3 per cent. of the stock and bonds of the Land Company. It is proposed to build an electric railroad to carry freight and passengers from Augusta, Ga., to Aiken, S. C., seventeen miles distant, and through the manufacturing towns of Clear Water, Bath, Langley, Warrenville and Graniteville. The railroad and power-house of the new company are being rapidly constructed, and all material and machinery, as well as the rolling stock, have been purchased. Rights of way for the entire line of road have been secured, and depot sites have been donated by all the manufacturing towns through which the road will run. Rights through the principal streets of Aiken have also been secured.

The company owns 5000 acres of valuable land, fronting one and one-quarter miles on the Savannah river, just opposite Augusta, Ga., and running back about five miles towards Aiken. One thousand acres of this land have been plotted and set apart for manufacturing sites and building lots. Several prosperous industries are now in operation, and more than 100 dwellings have been erected, and are now occupied. A railroad connecting the manufacturing plants with the Southern Railway is the property of the company, but is under lease to the Southern Railway for twenty years. The company owns the railroad track now laid on the steel bridge spanning the river to Augusta, and has, in perpetuity, the exclusive right to run cars across this bridge. It owns a new and perfect water-works system sufficient to accommodate 5000 people.

The company has in its treasury $100,000 of notes from owners of houses and lots sold to them by the company on the instalment plan, and no purchaser has ever defaulted in his payments.

The railroad to Aiken will run for seven miles through the property of the company, and, on that portion of land not yet plotted into lots, new mills are now busy sawing lumber, and cordwood is also being cut for fuel supply. There is in sight abundant fuel supply for five years, which will prove a saving to the company of $7500 per year in cost of fuel for power.

These figures are said to be conservative as to the value of the assets of the company:

800 acres of land, divided into building lots at prices now being obtained	$800,000
200 acres, divided into plots for manufacturing plants at prices now being obtained	200,000
4000 acres lying directly between Augusta and Aiken	400,000
Steam railroad leased to Southern Railway	50,000
Water-works, complete	25,000
Notes in treasury of company being paid monthly	100,000
Electric road, power-house and electric-light plant	500,000
Total assets present valuation	$2,075,000

The statistics on interurban railroads throughout the country show from $2 to $10 per capita per annum passenger revenue from the population tributary to the line. The cities of Augusta and Aiken, together with the intervening towns through which the road will run, comprise a population of at least 75,000. Allowing for this road only $2 per capita of that population, gives a yield in passenger business of $150,000 gross, or $60,000 net, allowing 60 per cent. for operating expenses.

The net revenue of the company from all sources may be estimated as follows:

Earnings from electric road, passenger	$60,000	
Earnings from electric road, freight	15,000	
Income from notes yielding 12 per cent.	12,000	
Rental from steam road, water-works, natatorium and land leased to tenants	8,000	
		$95,000
Interest on bonds	$30,000	
Dividend to preferred 5 per cent.	25,000	
		55,000
Surplus equals 4 per cent. to common		$40,000

It is expected that a considerable city will be built up at North Augusta, as it is a rule for thriving towns to exist on the opposite sides of a river from a city of such importance as Augusta, Ga., which, with its suburbs, has some 60,000 population. Considerable development work is

already under way at North Augusta, and arrangements have been made for the erection on the picturesque heights of North Augusta of a magnificent winter-resort hotel on the order of the famous Bon Air at Summerville.

Following are the officers and directors of the company:

Officers—James U. Jackson, president, Augusta, Ga.; R. Lancaster Williams, vice-president, Richmond, Va.; A. H. Rutherfoord, treasurer, Baltimore, Md.; Henry Buist, general counsel, Charleston, S. C.; Walter M. Jackson, general manager, Augusta, Ga.; Lewis T. Taliaferro, secretary, Augusta, Ga.

Directors—James U. Jackson, Augusta, Ga., general agent Seaboard Air Line Railroad; R. Lancaster Williams, Richmond, Va. (John L. Williams & Sons), president Norfolk Railroad Co.; J. Wm. Middendorf, Baltimore Md. (J. Wm. Middendorf & Co., bankers), vice-president International Trust Co., vice-president Seaboard Air Line Railroad; John Blair MacAfee, Philadelphia, Pa., railroad constructor; Alfred S. Elliott, Wilmington, Del., banker; L. T. Taliaferro, Augusta, Ga., formerly cashier Commercial Bank; Henry Buist, Charleston, S. C., (Buist & Buist, lawyers); Marion J. Verdery, New York city (Latham, Alexander & Co., bankers); Walter M. Jackson, Augusta, Ga., general manager North Augusta Land Co., North Augusta Development Co.

GARBAGE CREMATION.

A Method Worthy of Investigation by All Municipalities.

In Atlanta, Ga., there has been in operation for the past two years a unique system of garbage cremation, which is attracting the attention of municipalities the country over, on account of the simplicity and economy of the method and the apparently complete success which it has attained. It is called the J. F. Lester Furnace Co.'s system, and it owns the incinerating patents and the crematory, and has the contract for disposing of the city's garbage and refuse. The apparatus consists of a series of furnaces so constructed and arranged that when the garbage or night soil is dumped into the hoppers prepared for its reception it is conveyed mechanically to the furnaces and burned to cinders. One of the striking features of the system is that the garbage supplies the fuel for the fires. After the furnace is once fired no other fuel is used, and the plant is kept running night and day. The cinders which result are conveyed mechanically through a pulverizer, and thence loaded into cars for shipment to fertilizer works, where they are prized very highly as a base for the commercial fertilizer, the cinders being especially rich in potash and phosphorous matter. In addition to about 150 tons of garbage thus treated daily, nearly fifty tons of night soil, of which more than 90 per cent. is water, is likewise disposed of. The processes are described as being exceedingly simple, while at the same time thoroughly effective. The furnaces are provided with mechanical draft apparatus and thermostatic regulators, which so accurately control the flow of gases as to entirely consume them before they leave the gas-burning retorts. The outlets from the fans are connected to a series of acid baths, retorted together in such a manner that pure air is delivered at the final opening a few feet above the roof. In addition to burning the city garbage and night soil, the company is now installing a power plant, and expects to develop approximately 3000 horse-power of boiler energy from the heat developed in these furnaces. The entire plant is manned and operated by a force of ten men, divided into two shifts of five each. As the garbage question is one of vital interest the whole country over, and experiments in garbage cremation are being carried on in an elaborate and costly scale in many places, the successful operation of the Lester plant at Atlanta cannot fail to attract wide attention.

TRADE NOTES.

Paints—Red and Otherwise.

The Chattanooga Paint Co. of Chattanooga, Tenn., manufactures a high grade of red oxide of iron paint, which is claimed to be a superior article for tin, iron or shingle roofs, railroad cars, bridges, barns, fences, outbuildings, and any place where protection from the weather is desired. It is used extensively by many of the largest carriage and wagon manufacturers and paint grinders in the United States. The company also manufactures metallic paints and mortar colors, which are very economical, and are guaranteed to be unsurpassed in strength, fineness and body, and in durability, covering power and permanency in color. Samples and quotations will be furnished.

Beds—Iron and Brass.

The progress made in the manufacture of beds is strikingly typified in the designs placed on the market by the Foster Bros. Manufacturing Co. of Baltimore, whose advertisement appears elsewhere in this issue. The company makes a specialty of iron and brass and combinations of these metals, and offers a remarkably large variety of patterns suitable for all purposes. The patterns include the massive effects so much favored, as well as the lighter designs. The company has a high reputation for its mattresses of woven wire, spring beds and cots. One of its specialties is bedsteads for institutions. It manufactures for the trade only. Its new catalogue contains reproductions of its exclusive patterns.

Mining, Logging and Other Cars.

Prominent among Southern manufacturers of small cars is the Peacock Iron Works, Selma, Ala., at whose extensive plant are manufactured mining, logging, plantation, sugar-cane and other small cars of all sizes and kinds, also wheels, axles, irons, etc., and its products are extensively used in all sections of the United States from New England to Mexico, and from California to Cuba. It makes a specialty of contracting for every article in its line, and numbers among its customers the United States government and prominent manufacturing concerns in all sections of this, as well as other countries. Its extensive business is conducted on liberal methods, and it cheerfully furnishes estimates and prices upon request. It is now building a large number of cars for Mexico, as well as large orders for this country.

Building Engines in North Carolina.

The High Point Machine Works of High Point, N. C., is one of the successful enterprises at that place, having had little less than a marvelous growth. From a small beginning, ten years ago, it now enjoys a wide trade among the prominent factories and mill men of the South. The business is owned practically by Mr. O. N. Richardson, who looks after every detail. The High Point engine manufactured is one of the most popular now on the market, and it is almost impossible to supply the demand. It is a high-class engine, and there has been no trouble in placing different styles of them as rapidly as they are made. They are built in twenty sizes, running from five to eighty horse-power. Styles made are horizontal, vertical and hoisting engines. There is 15,000 feet of floor space under one roof, not including the handsome offices.

High Point's First Furniture Factory.

The first furniture factory organized in High Point took the name of the town, and is known as the High Point Furniture Co. This company was organized ten years ago, and has been in successful operation ever since, having an exceedingly large trade covering several States North and South. While the company has always done well, it has never been so successful as it is today. It is owned by Mr. M. J. Wrenn, who devotes his entire time to the business. He has lately made many changes and additions to the plant, which he thought necessary to keep up with the times. The capacity of the plant has been doubled. This company has put many handsome lines of furniture on the market, which have taken well with the trade. Mr. Wrenn is always on the lookout for any change in style and finish of goods which will be of advantage to the trade.

Making Tables for Everybody.

The Piedmont Table Co. of High Point, N. C., was organized May 16, 1897, with a capital stock of $15,000. Its trade has increased to such an extent that it has had to materially increase the capacity of the factory. Goods are now being shipped to South Carolina, Georgia, Alabama, Virginia, West Virginia, New York, Connecticut, Rhode Island, Maryland and other States, and an order for 1000 tables from a firm in New York has been filled, and also an order for a carload for Maryland and Chicago has been received. The order from the latter place calls for a duplicate order every month afterward for twelve months. The company makes medium and high-grade extension, office and kitchen tables. The management of this concern is in the hands of Mr. Charles F. Long, who is the secretary and treasurer of the company, and since he has taken hold of the business it has largely increased.

Cotton-Mill Stocks for Investors.

Investments in stocks of Southern cotton mills have proved remarkably profitable in the great majority of cases. Not only have the mills very generally paid large and regular dividends, but in most cases the material advance in the value of their stocks has added largely to the profits of investors. By reason of the fact that mills were built rapidly in the South last year, the supply of local capital could not easily absorb all their securities, and the situation is therefore a very attractive one for buyers of mill stocks. The cotton mills of the South are making good profits, and, considering the attractive figures at which their stocks can be had, an inviting opportunity is afforded to people having money for investment and desiring a liberal return. Elsewhere in this issue will be found an advertisement of Mr. William S. Glenn, stock broker, Spartanburg, S. C., pointing out the attractive opportunity which is now presented for investments of this character, and quoting a large number of mill stocks.

Spartanburg Banking Interests.

The development of the cotton-mill business of South Carolina has to a very large extent been in the Piedmont region, Spartanburg county being one of the foremost sections in the cotton-mill industry of the South. The growth of this industry in and around Spartanburg during the last ten years has made that place one of the most important cotton-mill towns of the South, and the result has been a very large advance in general business interests, as shown in the growth of banking in that community. The Merchants and Farmers' Bank of Spartanburg, with a capital of $100,000 and a surplus of $40,000, was established in 1889, and since then has paid in dividends $88,000. It has a large line of deposits, and offers the best facilities for bankers or others desiring to do business in that section. Its officers and directors include a number of the strongest men in Spartanburg. At a meeting of the board of directors, held on February 5, Mr. A. L. White was unanimously elected president to fill the vacancy caused by the death of Mr. Joseph Walker.

A Great Dry Goods House.

The Daniel Miller Company of Baltimore recently increased its capital stock from $300,000 to $1,200,000. In connection with its increase of capital this company has also enlarged its quarters, and now occupies the six-story warehouses at 28, 30 and 32 Hopkins Place, which extend through and include 25, 27 and 29 South Liberty street. The warehouse at 32 Hopkins Place has recently undergone extensive improvements to prepare it for the company's business. The aggregate floor space now occupied is 110,000 square feet. This company is one of the largest of its kind in the country, and its business embraces the general dry goods trade, the features including dress goods, silks, white goods, linens, hosiery, underwear and small wear. Besides being direct importers, the Daniel Miller Company controls in this market the products of a number of large mills throughout the country. The scope of its trade extends from the New York State line on the north through the South and West, taking in all of the Southern States and running west to Ohio. The members of this company are young, active and experienced men in the dry goods trade. The officers of the Daniel Miller Company are: President, Mr. Theodore K. Miller; treasurer, Mr. J. Albert Hughes; secretary, Mr. James M. Easter. These officials, with Messrs. Theodore K. Miller, Jr., and C. A. Hiss, constitute the board of directors, all of whom are active in the business of the company.

Brick Machinery.

Messrs. J. C. Steele & Sons of Statesville, N. C., manufacturers of the New South brick machines, report their trade for last year as having been very satisfactory, and are in receipt of a large number of orders for present and future delivery. Their XX brick machine, with single-column, end-cut automatic table, is becoming well and favorably known. This machine embodies the most up-to-date principles in modern brick-making. They claim this machine equal to anything on the market, and that the single-column, end-cut brick is the best and strongest made. It can be furnished with side-cut when so desired. It is fitted with seven-inch bronze thrust bearing, and a very heavy U bolt for adjusting the main shaft, and thus keeping the point augur close to die and keeping the capacity up as the point augur wears. The point augur for end-cut is a single screw with two turns. An improvement has just been added to their machine in the point augur which increases the quantity and quality. The machine is provided with friction clutch pulley, feed roller, hinged front and hardened steam die. The bearings are very long, and are babbitted with the best material. The automatic cutter is made on the same principle as the cutters for smaller machines, hundreds of which are in use. The firm is about to place on the market a new automatic cutting table which has just been patented, and which will greatly increase the capacity. The capacity of their machines is from 3500 to 5000 brick per hour.

Making Telephones for the Whole Country.

A manufacturing enterprise of the South that is attracting considerable attention is that of the Sumter Telephone Manufacturing Co., located at Sumter, S. C. It has a very complete factory equipment, and makes practically everything entering into the construction of its large line of apparatus. Its machinery department is completely furnished with the latest and best types of machines, including many automatic and labor-saving tools. The main factory building is 470 feet long, there being 30,000 square feet of floor space, and the arrangement of departments is such that each is separate and distinct. Large sub-die and punching power presses are used for the stamping of all metal parts, and for the manufacture of tools, dies, etc., there is a perfectly-equipped toolmaking department. A feature of the Sumter instruments is the magnificent finish given the woodwork. The wood is sawed by the company's own band-saw mill, and all wood parts are manufactured right from the log. The Sumter Telephone Manufacturing Co. is turning out a line of telephones adapted to either local or long-distance service. It has equipped a large number of exchanges throughout the Middle and Southern States, and its business is rapidly increasing and extending to all parts of the United States and several foreign countries. The officers are Col. R. M. Wallace, president; Mr. C. T. Mason, vice-president; Mr. F. C. Manning, secretary, and Mr. C. G. Rowland, treasurer.

High Point National Bank.

The National Bank of High Point, N. C., opened for business May 31, 1886. It supplied an existing need in the community, and has enjoyed universal confidence from the beginning. At that time there was only one bank in Greensboro, two at Winston and none at Lexington. There are only thirteen banks, out of the present number of 118 in the State, which have been in continuous operation longer than this one. On November 1, 1888, the former cashier resigned, and Mr. E. M. Armfield, the present cashier, was elected to succeed him. The bank is located on the corner of College and Salem streets, and occupies a commodious, well-lighted and ventilated building, which is equipped with fire and burglar proof vault and safe, double time-lock and safe-deposit boxes. There have been but few changes either in the management or shareholders of the bank, only ten shares of stock having changed hands in seven years. It has paid 114 per cent. ($57,000) in dividends, besides accumulating a surplus and undivided profit account of 70 per cent. ($35,000) since its organization. High Point is indebted in a great measure for what it is today to this institution, for it stimulated business along all lines and assisted the manufacturing industries. Its officers and shareholders are largely interested in a large number of factories located there. The officers and directors of the bank have within the past three years established State banks at Randolph, Asheboro, Thomasville, Graham, Troy, Madison and Carthage, N. C., all of which use this bank as a depository. The bank solicits the accounts of banks, individuals, firms and corporations, and guarantees every facility and accommodation which their business and responsibility warrant. Mr. W. J. Armfield, Sr., is the president of the bank; Mr. E. M. Armfield, cashier, and Messrs. W. H. Ragan, J. A. Lindsay, J. H. Millis, N. C. English and W. J. Armfield, board of directors.

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